ENGINEERING PROPERTIES OF SEDIMENTS IN THE VICINITY OF GUIDE SEAMOUNT

by

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THESIS

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ABSTRACT

The sophisticated vane shear apparatus for determining the shear strength of deep ocean sediment cores was modified so as to be portable and versatile for use in a laboratory and on board a ship. The apparatus utilizes a torque transducer that is insensitive to temperature changes or orientation and capable of measuring torque over the entire range of shear strength encountered in marine sediments. Shear strength measurements can be made with minimum disturbance to the sediment sample by testing directly in the core liner. The apparatus was used to determine shear strength of ten deep ocean cores from the Guide Seamount region, located about 70 miles west of the central California coast. The study also included the determination of other engineering properties of the sediment cores.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACKNOWLEDGEMENTS

Appreciation is expressed to Dr. R. J. Smith for his assistance and guidance throughout this investigation. A note of thanks is given to Mr. S. P. Tucker for his encouragement and suggestions. The outstanding help and cooperation provided by the Machine Facility and Photographic Laboratory of the Naval Postgraduate School is greatly appreciated. Special thanks are extended to Miss Georgia Galloway for her typing assistance. A debt of gratitude is owed to the Office of Research and Development, Naval Facilities Engineering Command, for the interest and support provided towards the completion of this effort.

I. INTRODUCTION

A. GENERAL

The rapid advance in science and technology within the past several years has set the stage for more complete undersea exploration. It is apparent that there will be an increased use of both shallow and deep marine waters for various purposes. Because underwater structures will be supported by or penetrate into the sea floor, a knowledge of the engineering properties of the sea floor is required. Bearing capacity, breakout forces, trafficability, and slope stability are some of the important areas which are directly or indirectly related to the shear strength of sediments.

The present techniques for sea floor sediment investigation are far from being perfected. The problems of how to obtain an undisturbed sample or make in-situ measurements still have to be overcome.

Analyses can be made on slightly disturbed samples obtained with coring tools. Some of the present methods used to determine the strength parameters of deep sea sediments include unconfined compression, triaxial shear, direct shear, vane shear, and cone penetrometer tests. According to Richards (1961) and Smith (1962), the disturbance of a sample is minimized by employing the vane shear test. Because the sample does not have to be removed from the core liner prior to testing, use of the vane shear permits working with sediments of high water content. The vane shear technique of obtaining shear strength is open to some criticism, but the measured results are frequently found to be of the same order of magnitude as those obtained by more standard methods. Some of the marine sediments can only be handled in this manner as a result of their low consistency.

B. SCOPE OF STUDY

A versatile vane-shear apparatus was developed by Minugh (1970) utilizing a constant speed motor train and transducer to measure the amount of torque on the vanes at the time of sediment failure. In that the components of this apparatus were large and heavy, a more lightweight and portable apparatus would be desirable. Modifications were made to the apparatus to facilitate a more positively controlled height adjustment system. Other components were pared down in size and weight to meet the portability requirement.

Ten deep sea sediment cores were then taken in the vicinity of Guide Seamount and the following engineering properties were studied:

a. Vane Shear Strength
b. Remolded Strength
c. Sensitivity
d. Bulk Wet Density
e. Water Content
f. Specific Gravity of Solids (computed from the bulk wet density and water content)
g. Dry Density
h. Void Ratio
i. Porosity

The newly designed vane shear apparatus was tested on board ship at sea during this program and the results obtained were compared with those found in laboratory tests.

C. SUMMARY OF PREVIOUS WORK

1. Vane Shear Test Apparatus

Present day vane shear test devices are adaptations of the early vane borers. The vane borer was developed simultaneously in Sweden by John Olsson in 1928 and in Germany in 1929, according to

Osterberg (1957). Cadling and Odenstad (1950) then described a method of obtaining the shear strength of clays in-situ by using a vane device.

The shear strength of the soil was considered as related to the maximum torque developed from vane rotation by the following formula, derivation of which appears in Appendix A:

$$s = \frac{T}{(2\pi r^2 h + 4/3\ \pi r^3)}$$

where

s = shear strength
T = maximum torsional moment required to produce shear
r = radius of vane
h = height of vane

According to Carlson (1948), this formula assumes that the surface of rupture is a circular cylinder surrounding the vane and at the moment of maximum torque the shear stress is fully developed and uniform over the entire surface, including the ends of the cylinder. The above assumption appears valid and is consistent with the results of tests conducted by Inderbitzen (1969). A more detailed description of the vane shear test and its theory is presented by Skempton (1948) and Skempton and Bishop (1950).

Wilson (1963) reports that for cohesive soils (clays) the vane shear test has been found to be a reliable means of determining shear strength, especially in the case of sensitive soils and ones of lower shear strength. Hayen and Cohen (1967) note that the major limitation of the vane shear device is that it measures mainly cohesion. Whenever sandy or silty sediments are present, therefore, the shear strength

measurements with the vane provide a measure of the angle of internal friction in that the overburden pressure increases with sediment depth and a reading of vane shear strength at different depths gives a stress envelope from which the angle of friction can be derived. This procedure assumes a consistent sediment type through the depth of measurement. The derivation of cohesion and angle of friction is shown by Hayen and Cohen (1967); however, the effects of consolidation are not taken into account with this approach.

There are several varieties of vane shear testing equipment currently in use to determine the shear strength of marine sediments. The devices most widely used are:

a. Wykeham Farrance Vane Shear Apparatus, manufactured in England.
b. NCEL Vane Shear Device, designed by Smith (1962) at the Naval Civil Engineering Laboratory.
c. IIT Vane Shear Test Apparatus by Vey and Nelson (1966) at the Illinois Institute of Technology Research Institute.
d. Diver-Held Vane Shear Apparatus, developed by Dill and Moore (1965).

In comparison to the above, the vane shear apparatus designed by Minugh (1970) is the most sophisticated. The apparatus is made up of a constant speed electric motor, power supply and signal conditioning unit, and the output from the transducer to the recorder gives a continuous record of the amount of torque applied to the vane.

2. Guide Seamount

There have been limited studies conducted in the vicinity of Guide Seamount. The seamount is located about seventy miles off the coast of California, between Monterey and San Francisco at 37°-01.5' North Latitude and 123°-20.5' West Longitude, as shown in Figure 1. The seamount is approximately 13 kilometers long, 10 kilometers wide, and

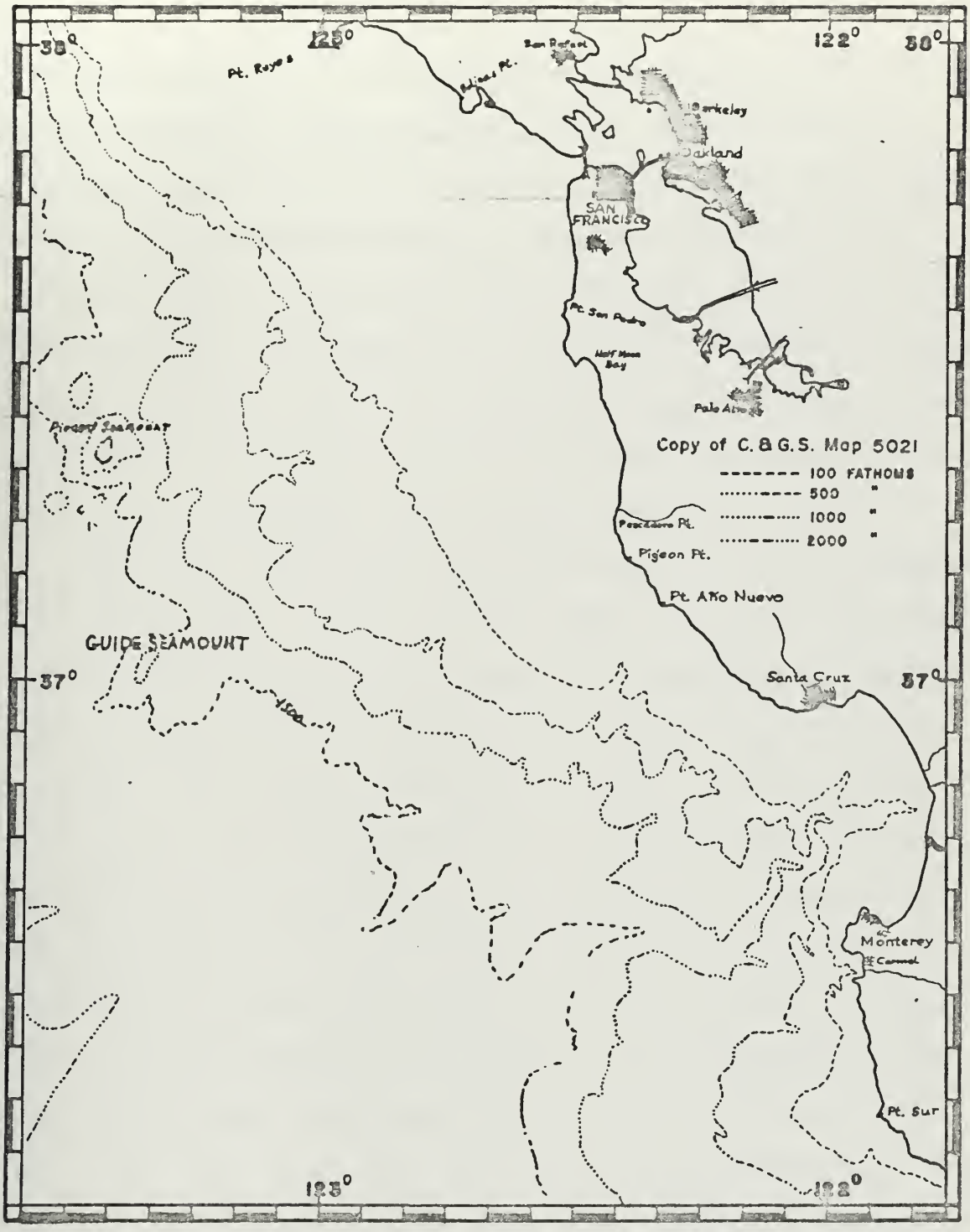


Figure 1: The location of Guide Seamount with respect to the central California coast.

1000 meters high. The study of submarine topography off the California coast, conducted by Shepard and Emery (1941), suggests that Guide Seamount is possibly a submarine volcano. It exhibits a northeasterly trend and has more than one summit. There is also evidence of the presence of small valleys on the sides. Its proximity to the base of the continental slope suggests that the two are interrelated, according to Uchupi and Emery (1961). The base of the slope represents a transition zone from the continental mass to the ocean floor and is therefore possibly an unstable region favorable for igneous activity.

Hanna (1952) states that only mud was obtained from Guide Seamount in a 15-inch dredge. Uchupi and Emery (1961) report that basalt pebbles and cobbles recovered from the seamount were found to be well-rounded, black to greyish-black in color, and also sometimes prophyritic and vesicular. The presence of pyroclastic material and the vesicular nature of the lava fragments suggested to MacDonald (1954) that the volcanic eruptions did not take place at their present water depth. The rounded nature of most of the lava fragments present on top the seamount also indicates the possibility that the crest of the submarine volcano was once exposed to wave action. Perhaps the sinking of the cone to its present depth may have been isostatic in response to its own weight. The age of the volcanism is not known, but the fact that the crest of the seamount is not buried under a blanket of sediments suggests a Late Tertiary age, possibly Miocene or younger.

No work has been done on the engineering properties of the marine sediments in the Guide Seamount region prior to this investigation. Most of the earlier investigations were either geologic in nature or sea floor contour studies.

II. DESIGN CONSIDERATIONS

A. PORTABLE VANE SHEAR APPARATUS

The existing vane shear apparatus is designed so as to be configured for laboratory or shipboard use. It was found, however, that it was too heavy and bulky to be considered as truly a portable device. Also, the rack and pinion vane height adjustment was not positively controlled and the device would tend to lower itself due to the weight of the motor and transducer. The apparatus consisted of the following components:

a. torque transducer
b. power supply and signal conditioning unit
c. bracket arm
d. swivel assembly
e. rack and pinion assembly
f. motor and motor mount
g. calibration stand and wheel
h. recorder

B. DESIGN CRITERIA

The design criteria used to improve the existing vane shear apparatus were as follows:

a. The apparatus would incorporate the original motor and torque transducer.
b. The weight and size of all the supporting components were to be reduced.
c. Design a positive vane height adjustment mechanism that could not free fall.
d. Design the apparatus to be portable with a carrying case.
e. Design the apparatus for various configurations of use, such as:
    1. A table stand arrangement that could be used in any orientation.
    2. A wall mounting system where the apparatus could be used in various orientations and easily removed.
    3. A method of using the apparatus for testing directly on a core liner.

4. The newly designed apparatus was adapted to the original mounting system to give added versatility.

f. The calibration system was incorporated into the carrying case to eliminate extra components.

g. Insure that there was laboratory and shipboard compatability of the apparatus.

III. VANE SHEAR APPARATUS

A. DESCRIPTION

The Naval Postgraduate School (NPS) Vane Shear Apparatus is basically the same instrument as designed by Minugh (1970) for laboratory and shipboard use. Several modifications have been included to improve the design of versatility and portability. The complete apparatus consists of the following components which are described in detail in the following section:

a. Constant speed electric motor, motor mount and housing
b. Torque transducer
c. Power supply and signal conditioning unit
d. Height adjustment mechanism
e. Core holding bracket
f. Wall mounting brackets
g. Table stand
h. Ball joint assembly
i. Modified swivel assembly to fit the original stand designed by Minugh
j. Set of various size vanes
k. Strip chart recorder
l. Carrying case and calibration system

1. Motor, Mount and Housing

The single phase, synchronous, heavy duty motor Model EA - H used in this device is manufactured by Hurst Manufacturing Corporation, Princeton, Indiana. It is rated at 150 inch-ounces of torque at one revolution per minute and requires 115 volts AC 60 cycle power. The output shaft rotates at one revolution per hour in a counter-clockwise direction. The reduction gears used are contained in a sealed unit and require no lubrication. The overall dimensions and characteristics are

shown in Fig. 2, supplied by the Hurst Manufacturing Corporation.

The motor is connected to the height adjustment mechanism by means of the aluminum mounting shown in Fig. 3 and Fig. 4. The plastic motor housing that was fabricated to protect the motor is shown on Fig. 3 and also on Fig. 5.

2. Torque Transducer

The torque transducer shown in Fig. 6 is an in-line semiconductor strain gage type, Model A44, manufactured by West Coast Research Corporation of Santa Monica, California. The range is 0-250 inch-ounces, although it may be over-torqued 100 percent without damage. The output of the transducer is 0.269 millivolts/volt excitation/in-ounce, and is linear throughout the entire range. Accuracy of the torque measurement is ±0.1 percent throughout the range. The internal resistance of the transducer is 350 ohms. The temperature response is 0.0045 millivolts/degree Fahrenheit, with 72 degrees Fahrenheit being the calibration temperature. The transducer will measure either clockwise or counter-clockwise torque, the polarity of the output signal indicating the direction. Excitation to the strain gages is a regulated five volt DC signal from the power supply unit. The output is unaffected by the orientation and it may be used horizontally, vertically, or obliquely.

The transducer is joined to the motor assembly by a 1/2" long 1/4"-28 threaded stud. The vanes are screwed into a 1/4"-28 female socket in the transducer. The transducer is connected to the power supply and signal conditioning unit by a four wire conductor cable.

When used for testing, the motor forces the vane to rotate in the sample. Resistance to this rotation provided by the sediment is opposite in direction to the vane rotation direction. This produces

MODEL EA-H

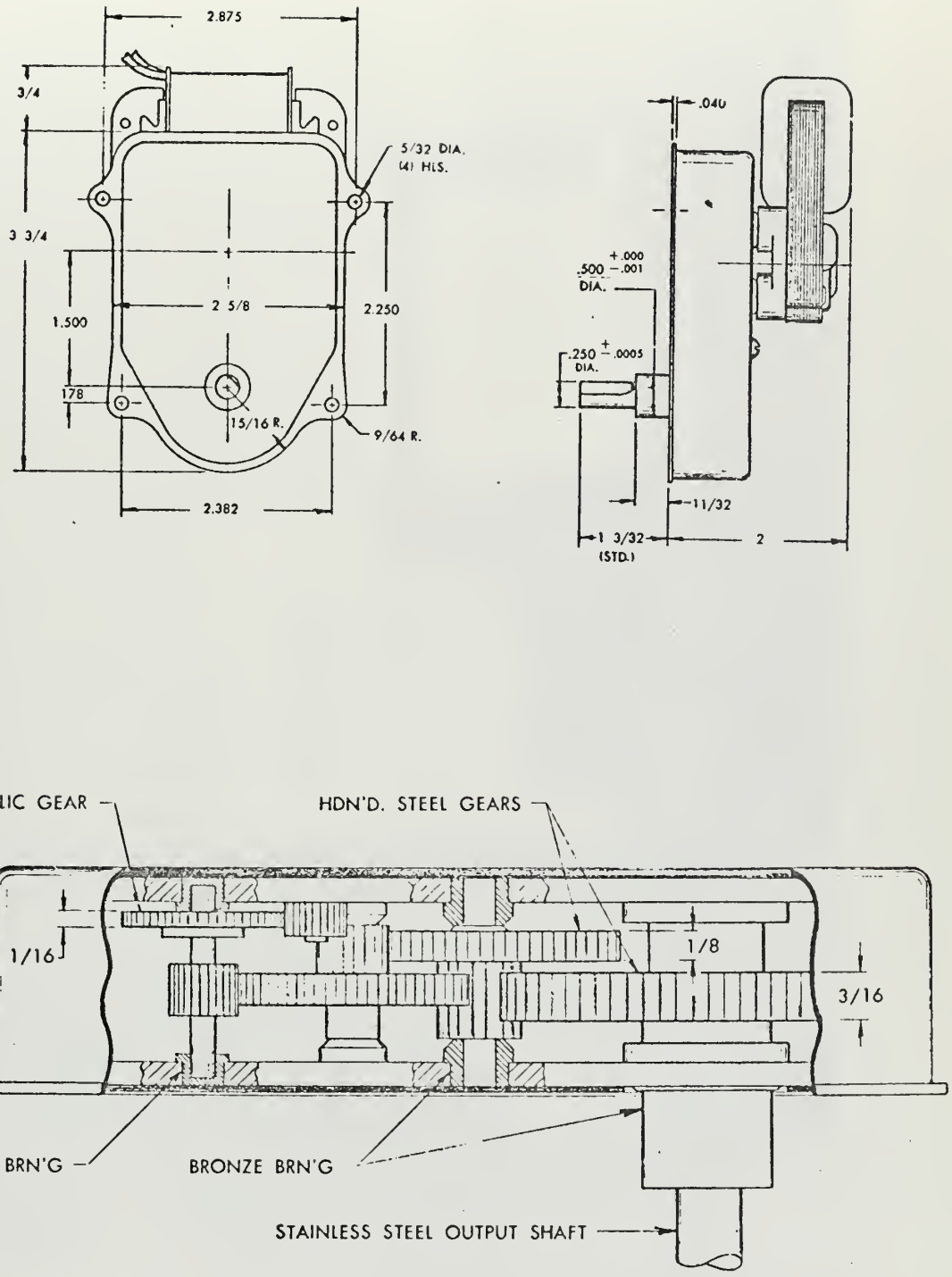


Figure 2: Dimensions of the motor used in the NPS Vane Shear Apparatus

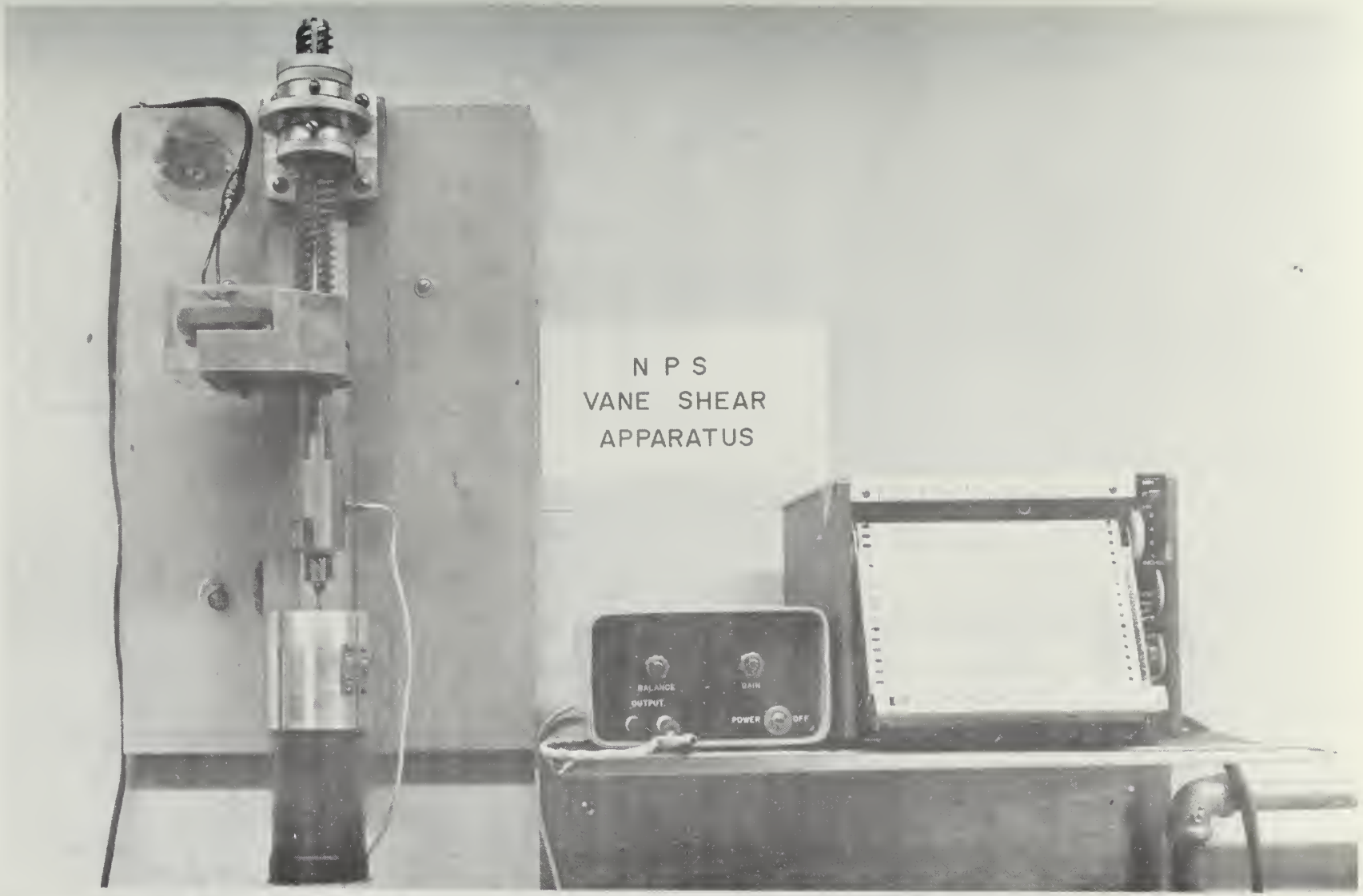


Figure 3: The NPS Vane Shear Apparatus as used when performing laboratory tests

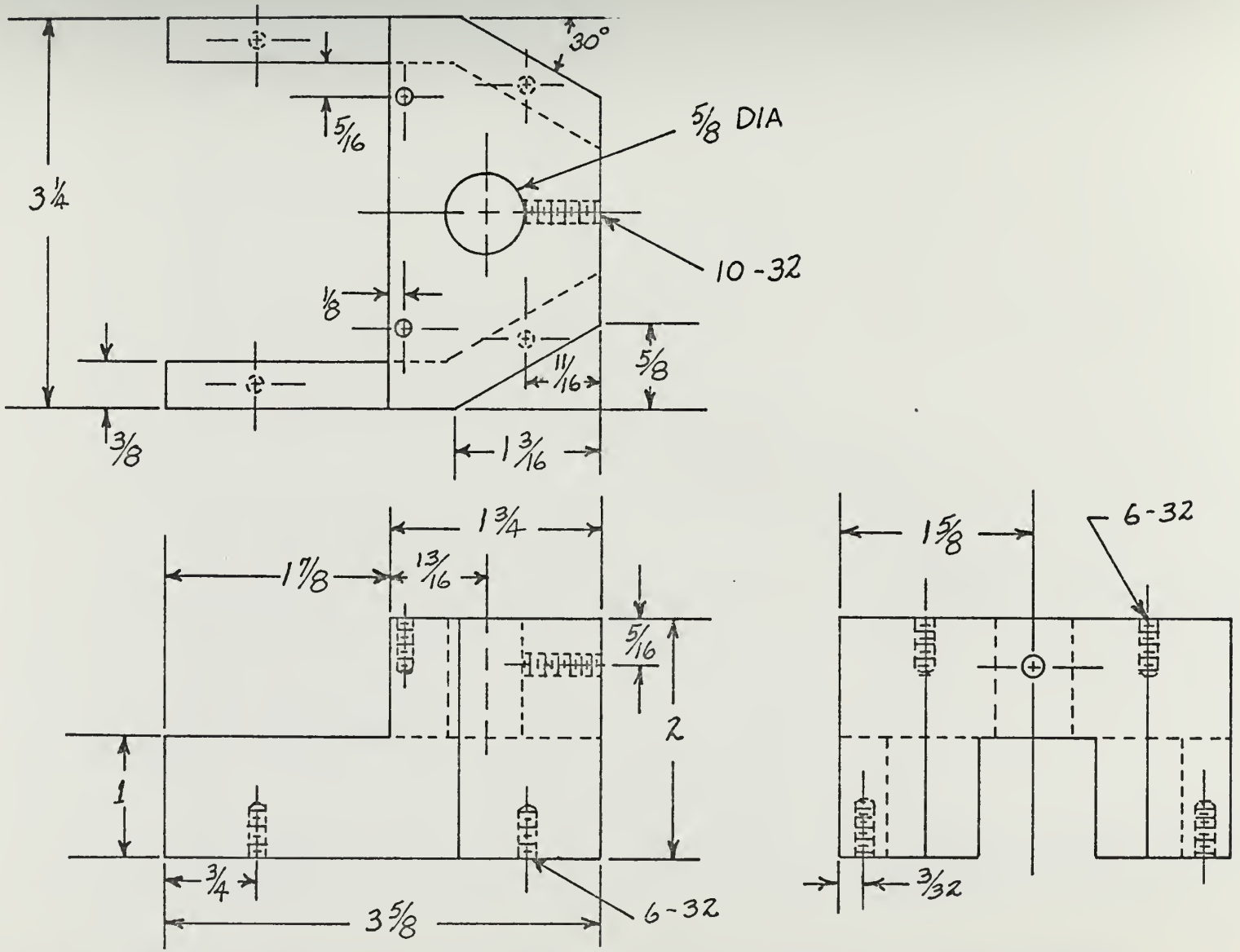


Figure 4: Detail drawing of the aluminum motor mount for the NPS Vane Shear Apparatus

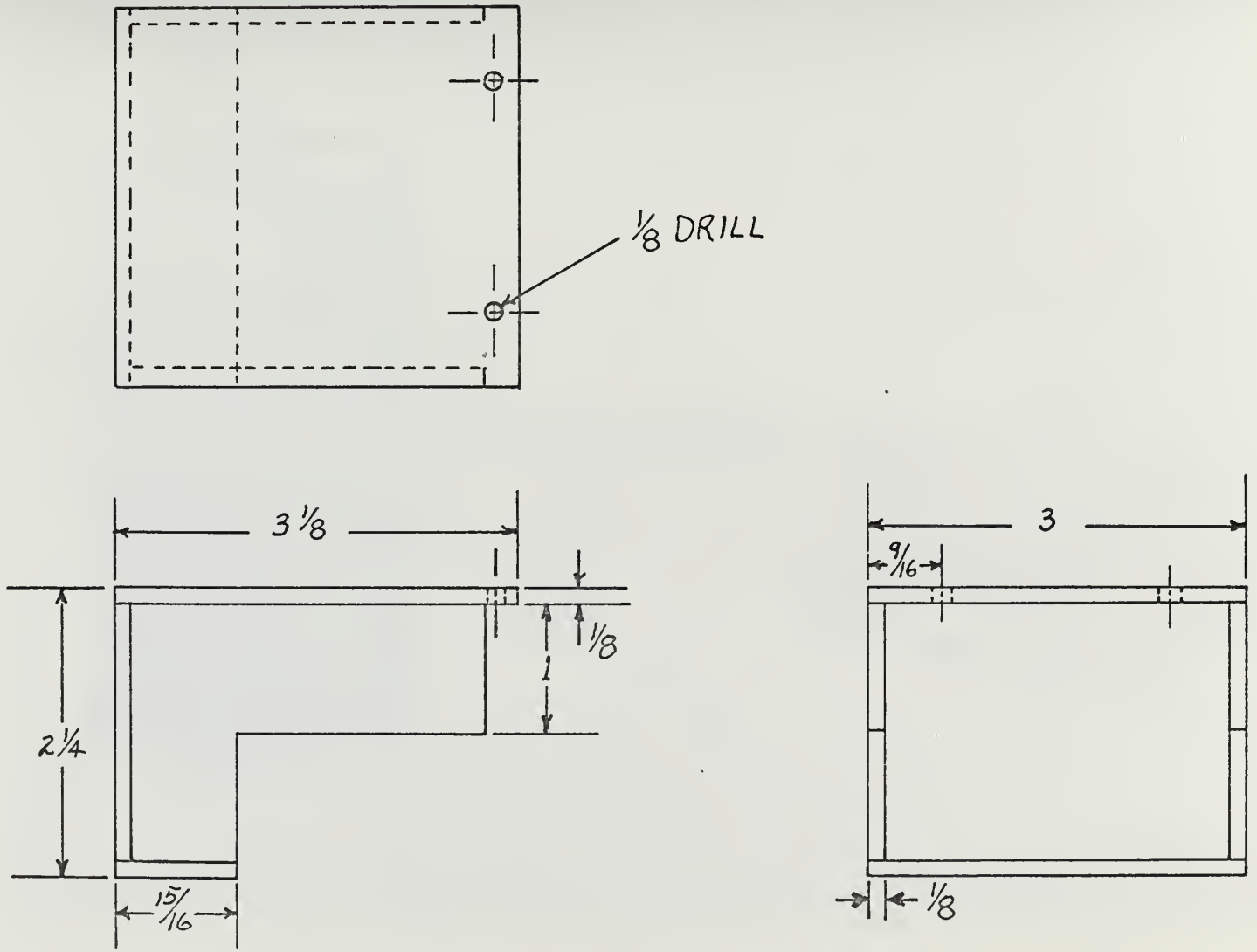


Figure 5: Detail drawing of the plastic motor housing for the NPS Vane Shear Apparatus

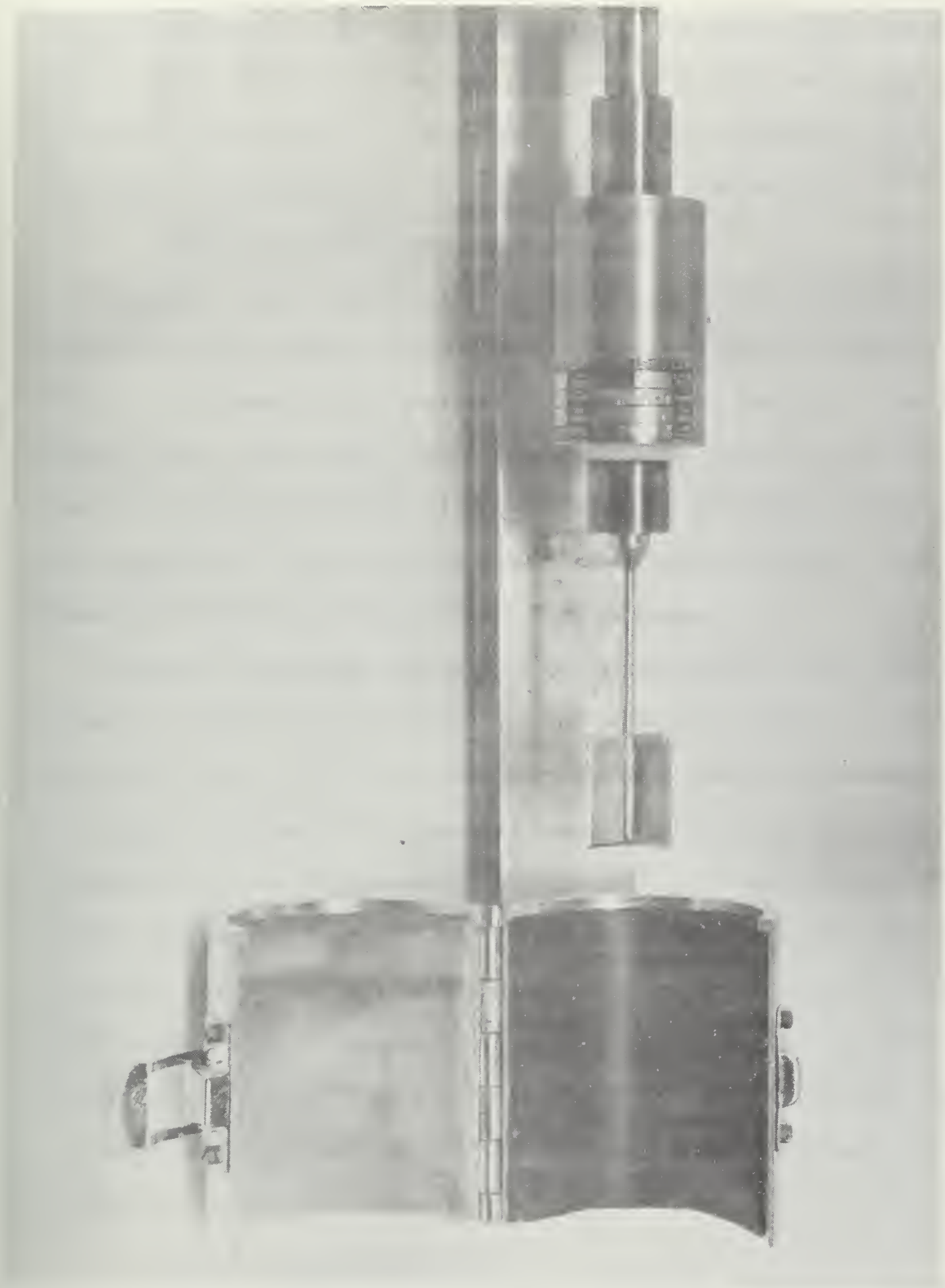


Figure 6: The torque transducer, vane, and core holding bracket for the NPS Vane Shear Apparatus.

a twisting moment to the torque transducer. The strain gages attached to the inner shaft of the transducer measure the shaft deflection caused by this twisting moment. The output of the strain gages is linear and is directly proportional to the amount of shaft deflection.

3. Power Supply and Signal Conditioning Unit

The power supply and signal conditioning unit is a combined transistorized power supply, bridge circuit, and amplifier, as shown in Fig. 3. The power supply provides five volt DC excitation to the strain gages. The output signal from the strain gages produces an imbalance in the bridge circuit proportional to the torque applied to the transducer. This imbalance results in an output which is fed through a variable gain amplifier to the recorder.

The unit is provided with a push button resistive circuit equivalent to a 125 inch-ounce torque and may be used to adjust the amplifier gain. When the "R Cal" button on the back panel is depressed, the signal from the strain gages is interrupted and the electrical equivalent of the 125 inch-ounce torque reading is substituted. Minugh (1970) recommended that a one volt full scale reading be set on the recorder, the "R Cal" button depressed, and the amplifier gain adjusted until the recorder trace reads 0.5 volts. This procedure sets the amplifier at four millivolts per inch-ounce torque. The balance knob is comparable to a "zero adjust" and allows the reference level to be shifted to any desired position.

4. Height Adjustment Mechanism

The height adjustment mechanism shown in Fig. 3 and Fig. 7 is constructed from aluminum and consists of the following components:

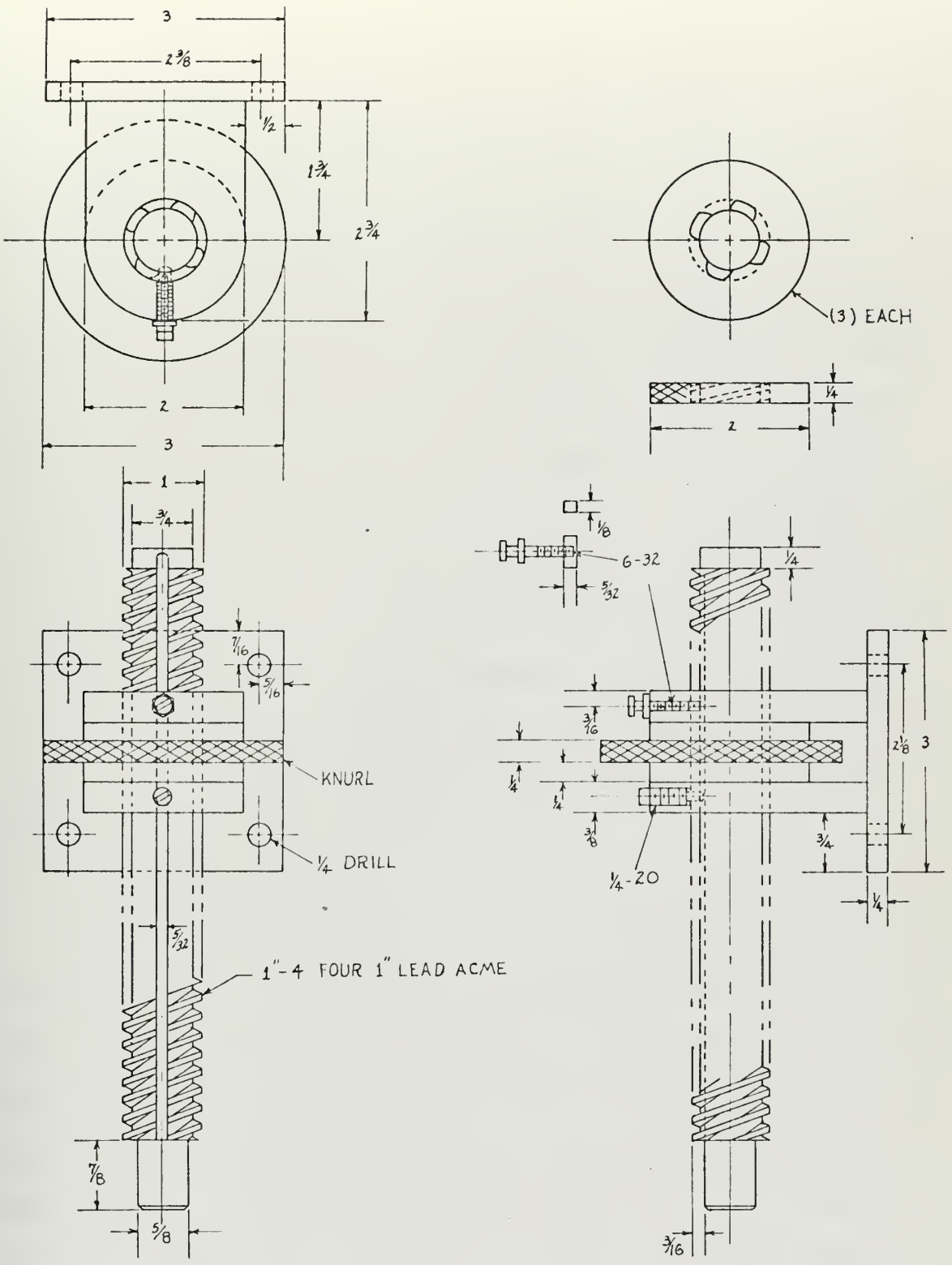


Figure 7: Detail drawing of the height adjustment mechanism for the NPS Vane Shear Apparatus

a. Guide bracket.
b. Threaded shaft with keyway.
c. Height adjusting nut.
d. Three locking nuts.
e. Two key pins.

The motor is fastened to the lower end of the threaded shaft by means of a socket in the motor mount and secured by a locking screw. The motor may also be rotated about the shaft to provide any desired orientation.

The mechanism can be bolted to various mountings so as to permit versatility in use. A means of positive control when lowering the vane into the sample is thus provided, and the unit will remain wherever stopped. The top locking nuts are used to set a desired stopping depth for multiple sample tests and the bottom nut is used to lock the entire assembly to keep it free from any motion. Application of the bottom nut is usually not necessary in the laboratory; however, aboard ship it aids in insuring that the apparatus is rigid.

5. Core Holding Bracket

The core holding bracket shown in Fig. 8 and Fig. 9 can be used in two different ways. One of these is to attach the bracket to the wall through use of a quick-removal wall mount. One of these was constructed of wood for laboratory use and another was constructed of aluminum, as shown in Fig. 3 and Fig. 8 as part of the portability package. The other method of using the core holding bracket is to attach it directly to a core, as shown by Fig. 10. The core must first be made secure in order to support the weight of the apparatus. The quick-release core holder shown in Figs. 6, 8 and 9 was designed to be used in conjunction with plastic core liners of a Ewing corer. The holder is constructed of aluminum and has a sponge rubber lining which absorbs the compressive

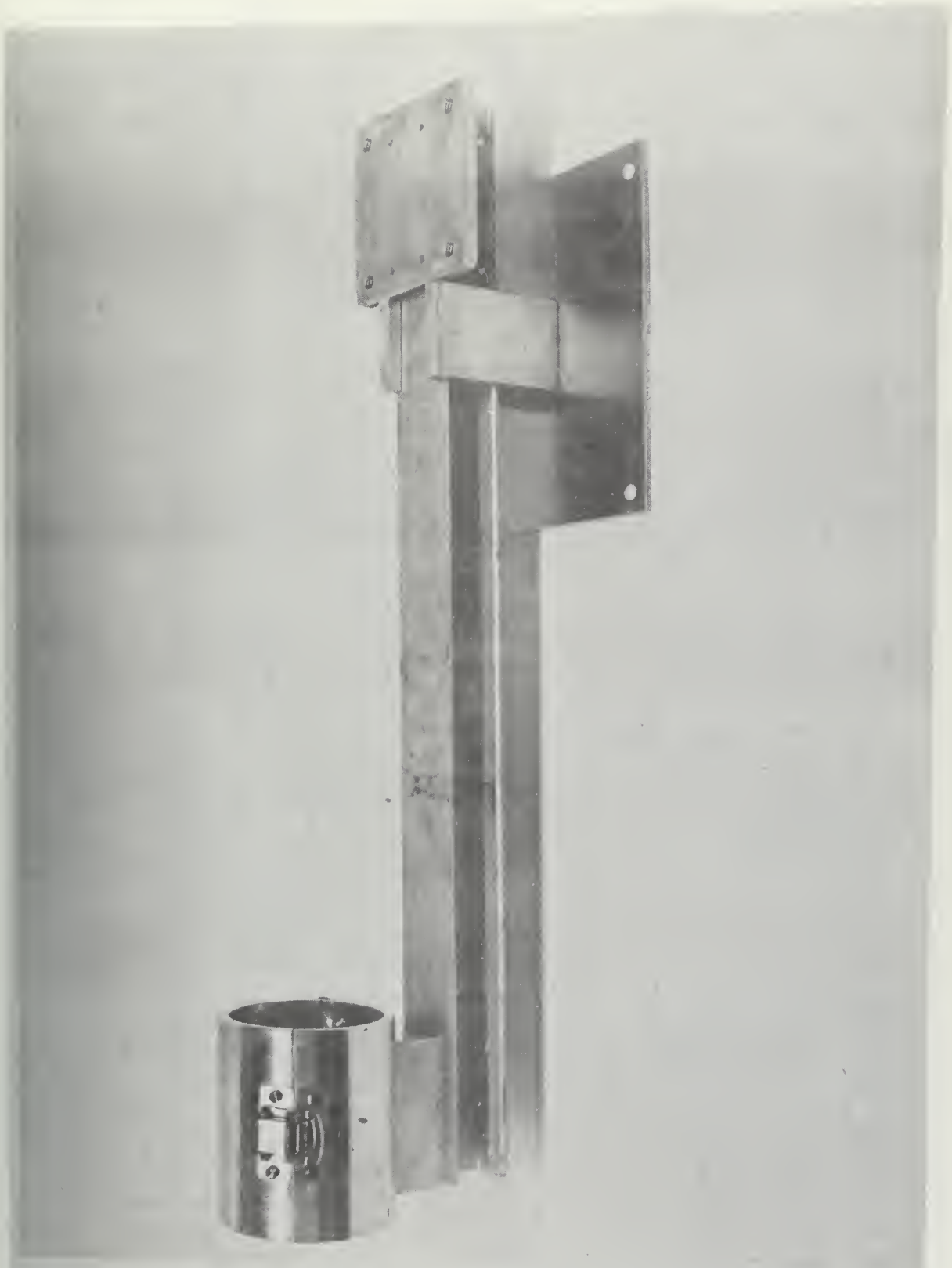


Figure 8: The core holding bracket showing the quick-release latch and the quick-removal wall mounting bracket for the NPS Vane Shear Apparatus

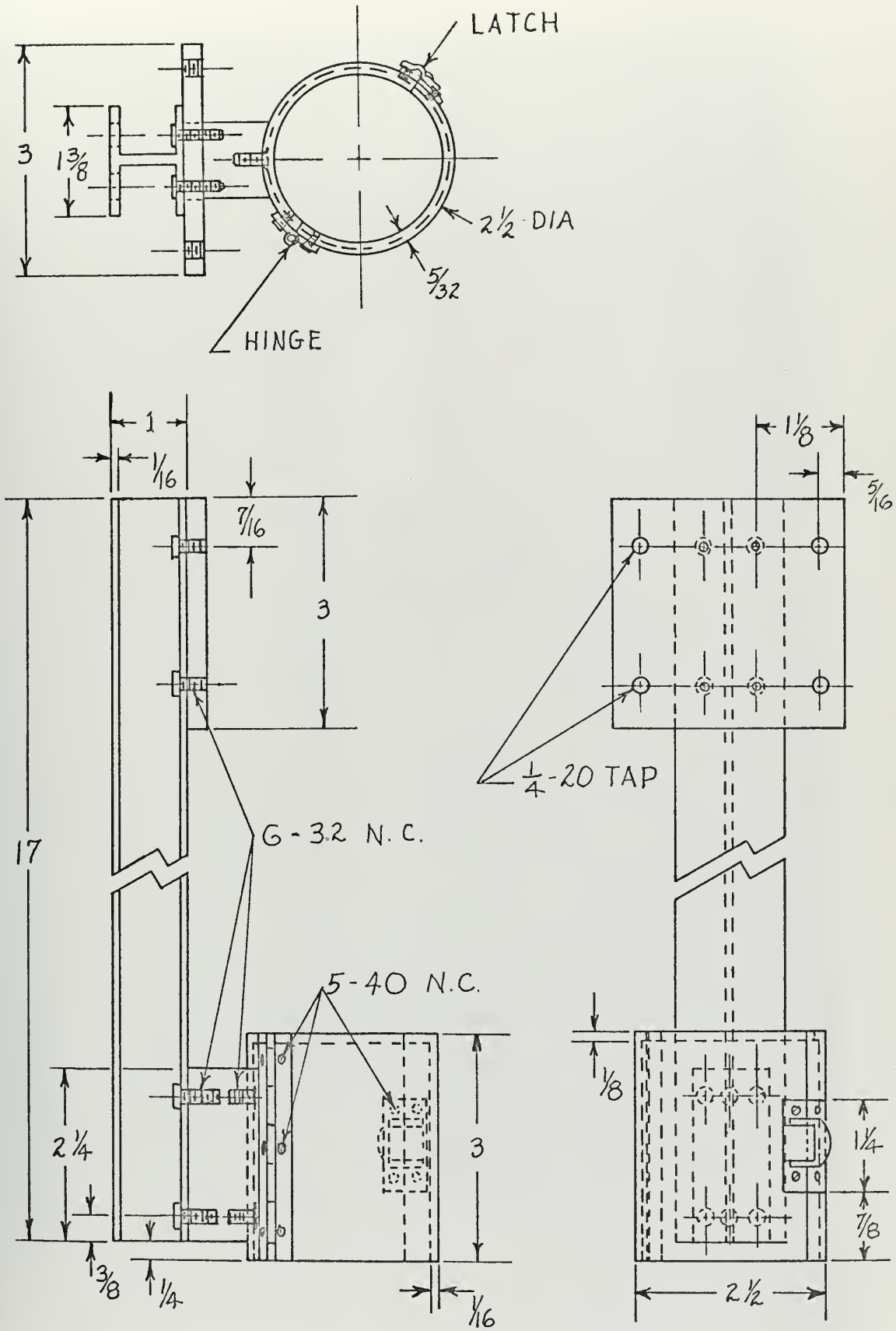


Figure 9: Detail drawing of the core holding bracket for the NPS Vane Shear Apparatus

Figure 10: The NPS Vane Shear Apparatus in the core mounted testing configuration

force of the closed casing. None of this force which might well produce disturbance in the sample is applied to the liner. The friction developed is sufficient to hold a core 60 inches long.

6. Wall Mounting Brackets

Three different wall mounting brackets were designed. The wooden bracket shown in Fig. 3 and Fig. 11 was constructed to hold the apparatus during use in the laboratory in conjunction with the core holding bracket. The aluminum bracket shown in Fig. 8 and Fig. 12 was also fabricated to be used in the same manner. The third wall bracket, shown in Fig. 13, is a straight mounting for the height adjustment mechanism. The ball joint assembly can also be mounted between the wall bracket and the height adjustment mechanism so as to give a freedom of orientation.

7. Table Stand

The table stand is made from 5/8 inch aluminum plate, eight inches square, with four 1/4 inch holes drilled near the corners to allow the stand to be bolted to a workbench. Two vertical aluminum rods one inch in diameter and twelve inches long provide a method of separation and attachment between the base plate and the height adjustment mechanism, as illustrated in Fig. 14 and Fig. 15. The vertical rods are offset in the center, both to give better balance to the instrument and to provide additional flexibility.

8. Ball Joint Assembly

The connecting link between the vertical rods and the table stand is the ball joint assembly shown in Figs. 14, 16 and 17. This assembly consists of the locking collar which clamps around the vertical rod, the ball joint unit for varied orientation, and the connecting plate used for attaching to the height adjustment mechanism.

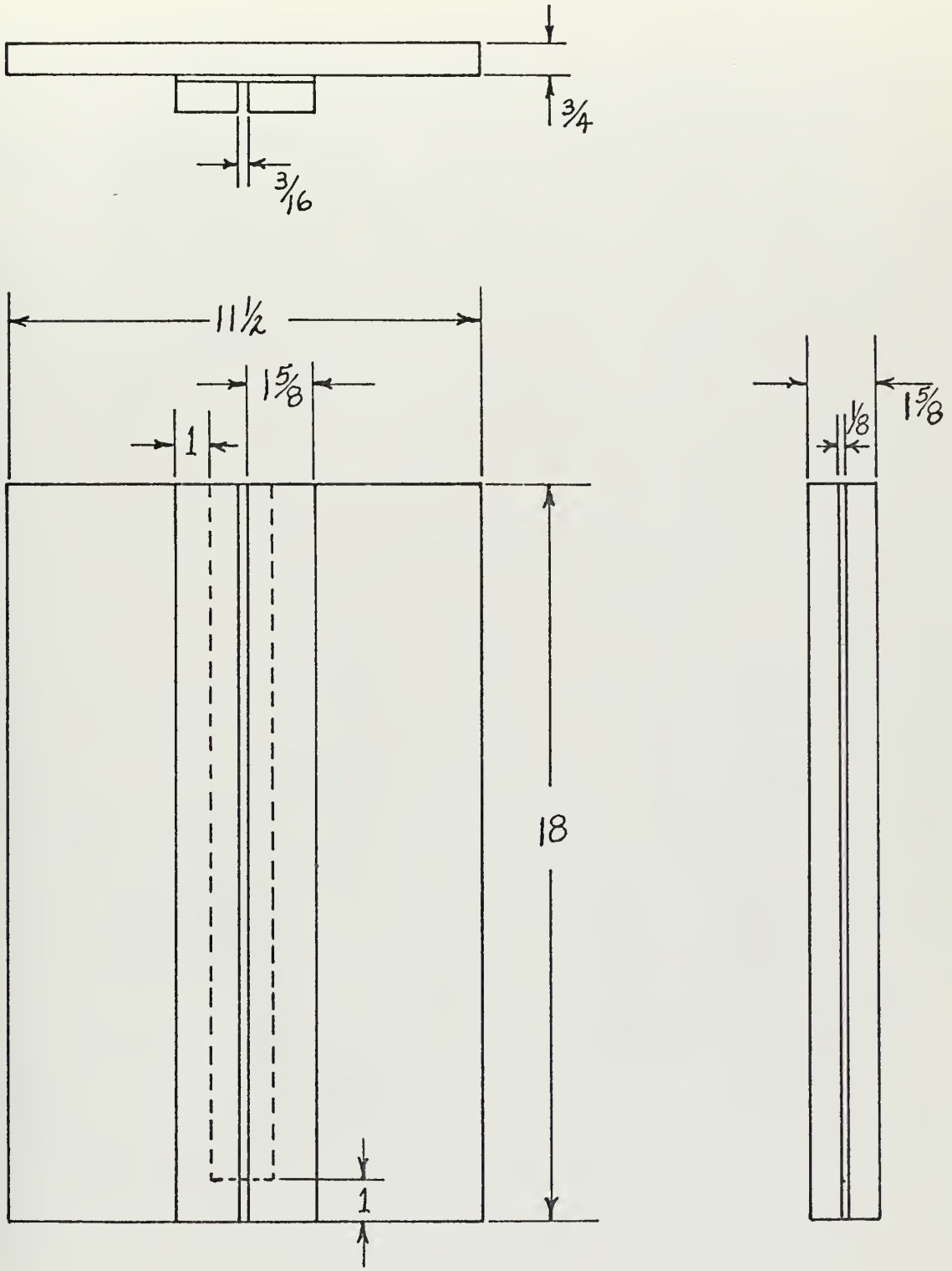


Figure 11: Detail drawing of the wooden wall mounting bracked used in the laboratory with the NPS Vane Shear Apparatus

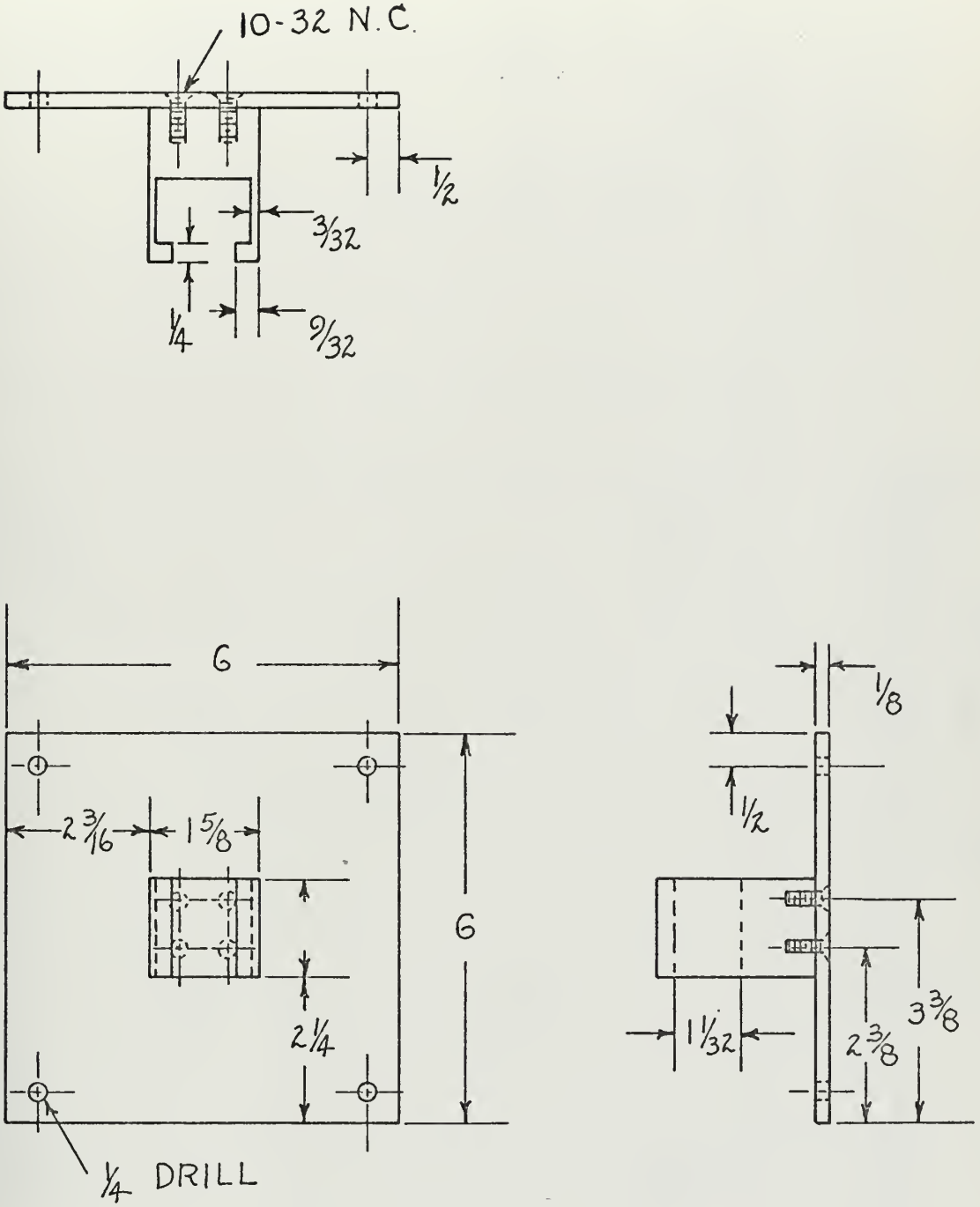


Figure 12: Detail drawing of the aluminum quick-removal wall mounting bracket for the NPS Vane Shear Apparatus

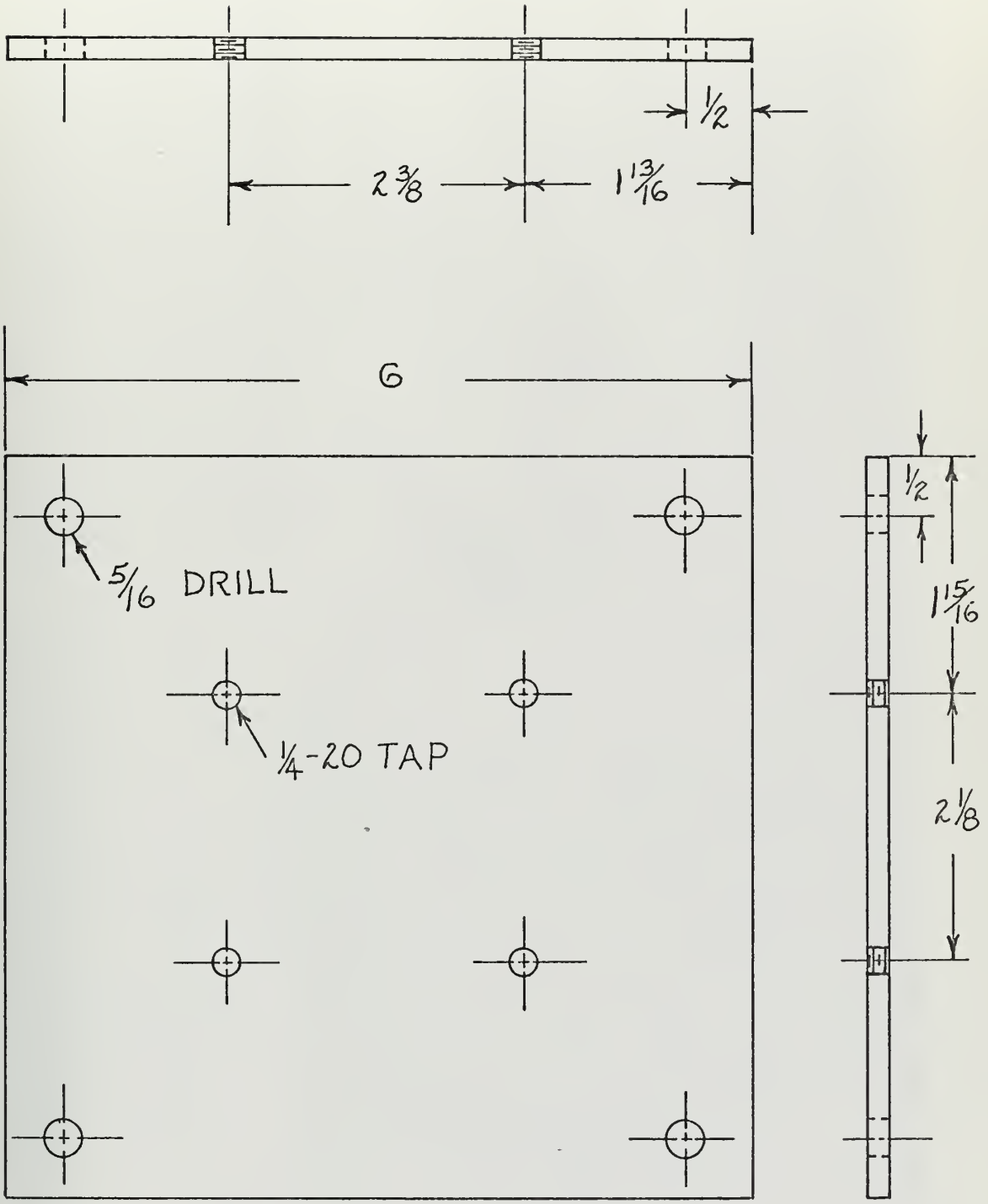


Figure 13: Detail drawing of the wall mounting plate for the NPS Vane Shear Apparatus

Figure 14: The NPS Vane Shear Apparatus in the table stand testing configuration

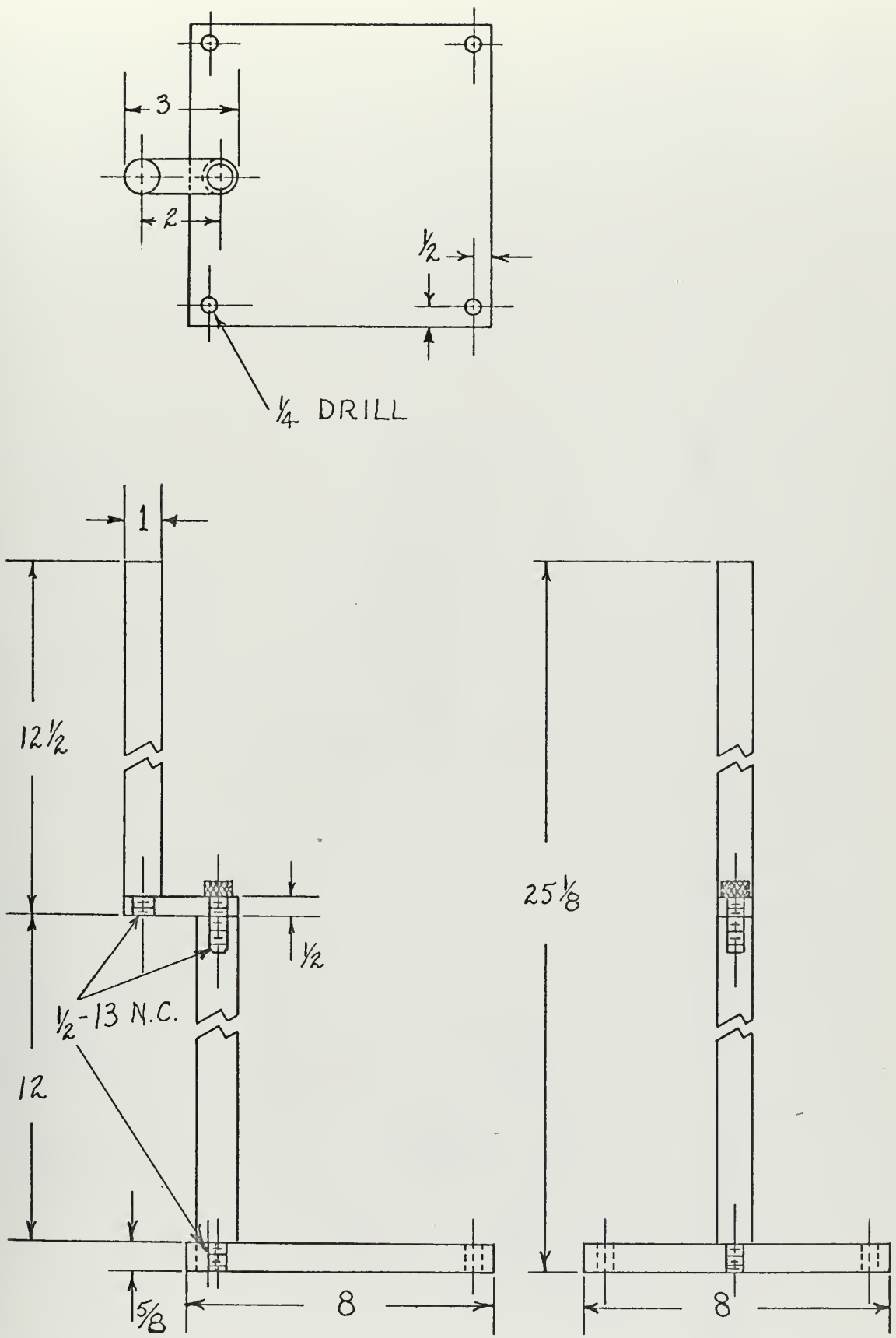


Figure 15: Detail drawing of the table stand for the NPS Vane Shear Apparatus

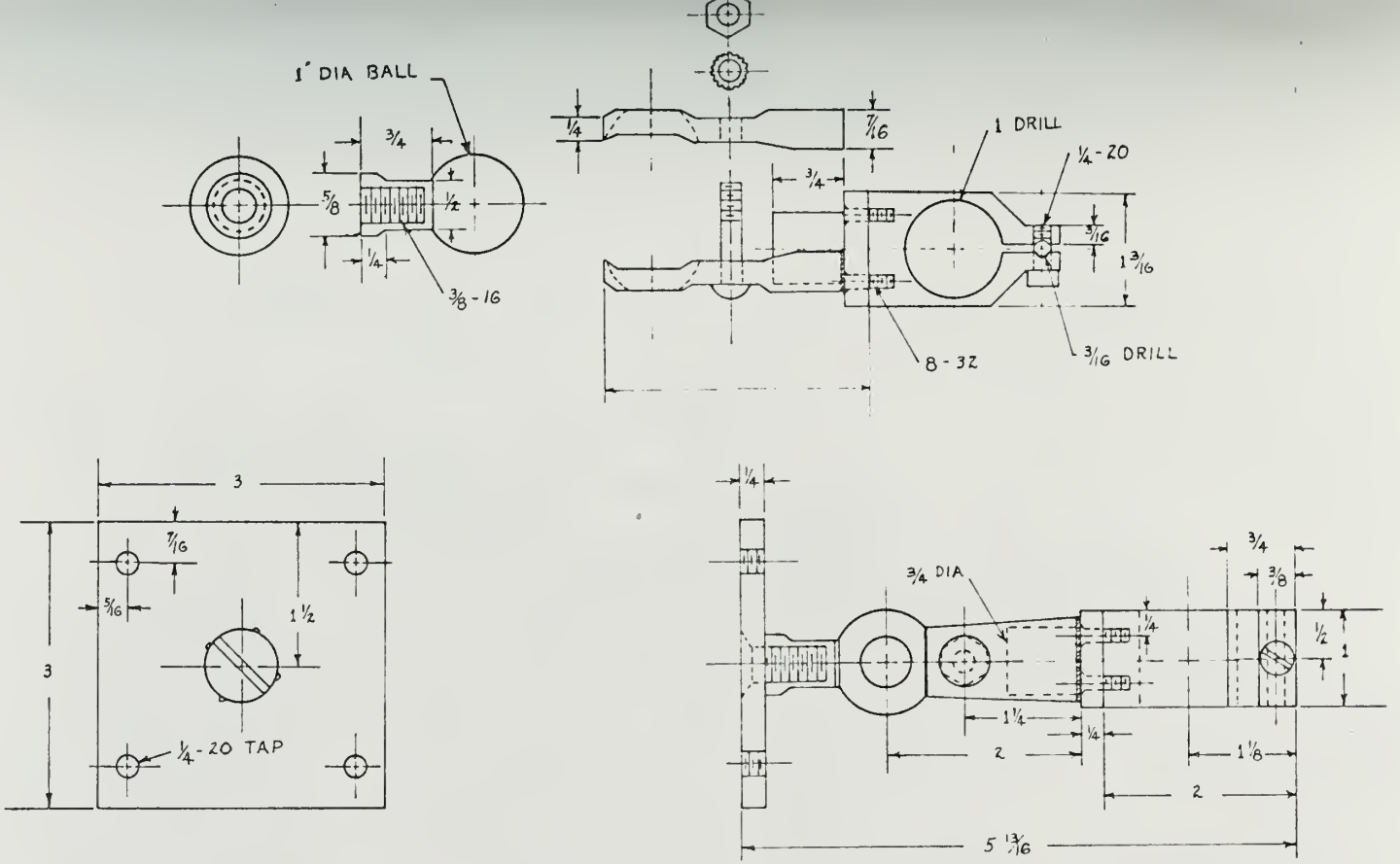


Figure 16: Detail drawing of the ball joint assembly for the NPS Vane Shear Apparatus

Figure 17: The NPS Vane Shear Apparatus in the table stand configuration depicting oblique testing

9. Swivel Assembly

The swivel assembly, as originally designed by Minugh (1970), was modified with the mating plate shown in Fig. 18 to accept the height adjustment mechanism. The swivel assembly shown in Fig. 19 rotates in two planes, whereas the ball joint provides a complete freedom of orientation of the apparatus. This modification of the swivel assembly allows the original stand as designed by Minugh to also be used.

10. Vanes

Five vanes were constructed for use with the vane shear apparatus and have the dimensions shown on Fig. 20. Both the vane and the shaft were constructed of stainless steel, and were fabricated independently and then silver-soldered together. The top of the shaft is designed to thread into the base of the transducer unit.

The denominator in the shear strength equation,

$$\frac{\pi d^2 h}{2} + \frac{\pi d^3}{6}$$

where d is the diameter and h is the height of the vane, is a constant for each vane size. Referring to this denominator as the Vane Factor, a listing of each size vane and its appropriate Factor is as follows:

Vane Dimensions (inches)		
Height	Diameter	Vane Factor (in^3)
1	1/2	0.45813
1/2	1/2	0.61780
1/2	1	1.30899
1	1	2.09438
1-1/2	1	2.87978

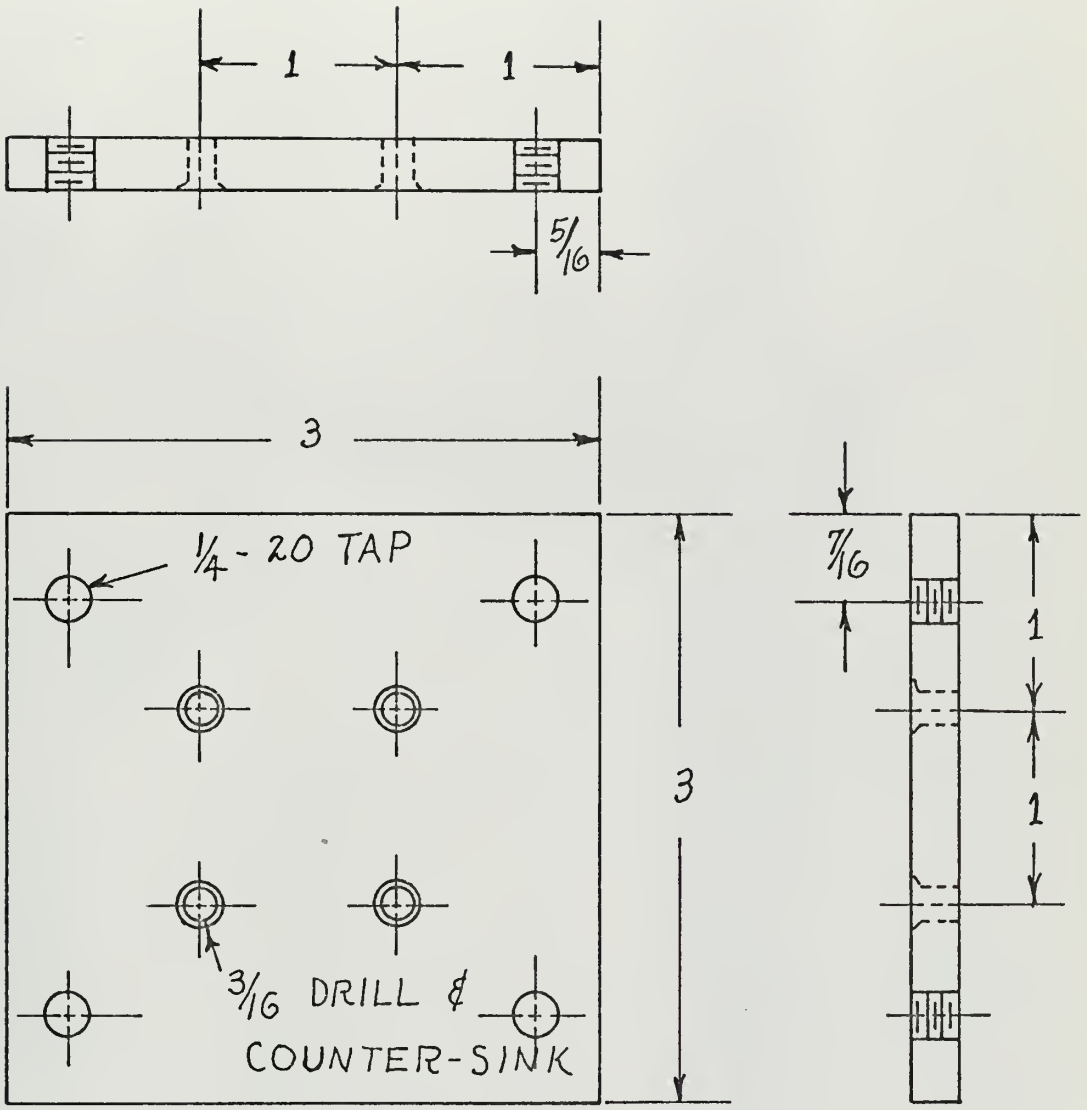


Figure 18: Detail drawing of the swivel assembly mating plate for the NPS Vane Shear Apparatus

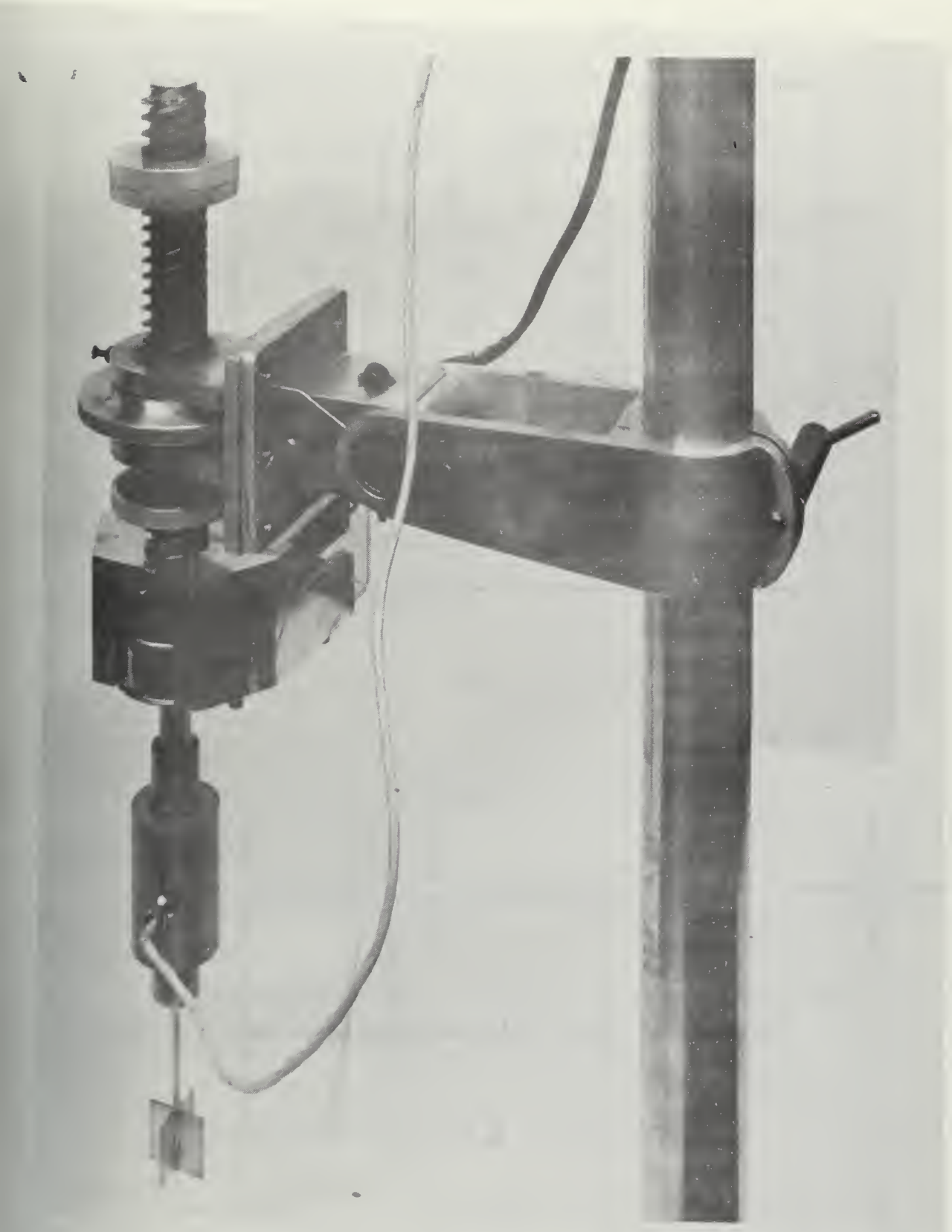


Figure 19: The NPS Vane Shear Apparatus mounted on the swivel assembly

VANE DIMENSIONS (in)			
D	H	L_1	L_2
1/2	1/2	3/4	1-3/4
1	1/2	3/4	1-3/4
1/2	1	1-1/2	3
1	1	1-1/2	3
1	1-1/2	2-1/4	4-1/4

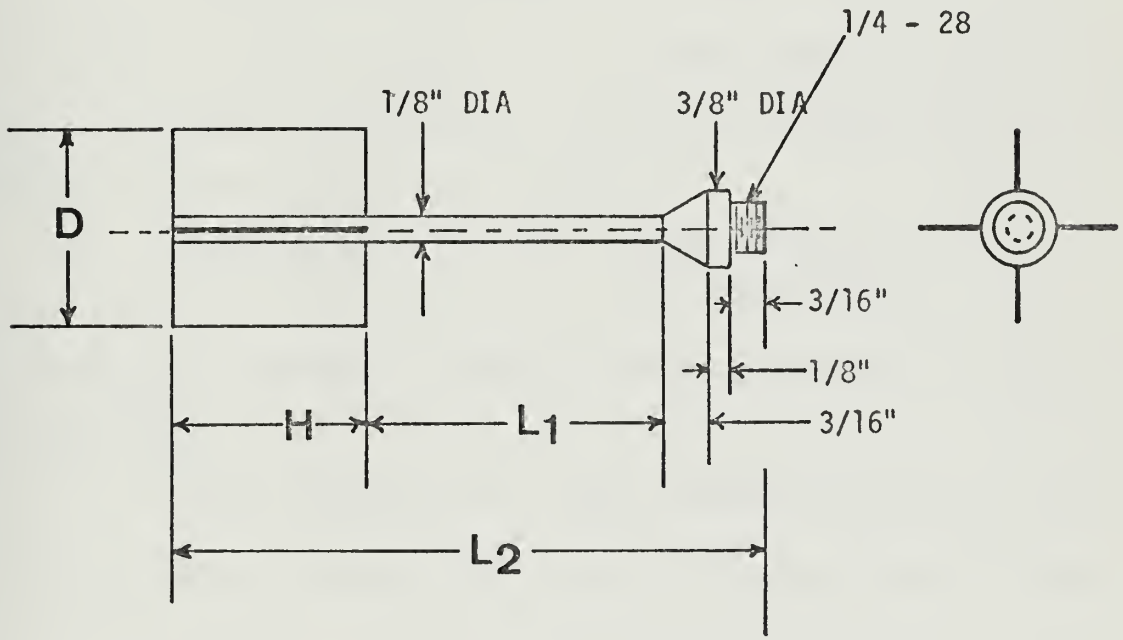


Figure 20: Detail drawing of the vanes for the NPS Vane Shear Apparatus

From the equation above, the shear strength in ounces per square inch is obtained by dividing the maximum torque required to shear the sediment in inch-ounces by the appropriate Vane Factor. Most sediment shear strengths are presently reported in units of pounds per square inch; hence, a computer program was written to convert directly from millivolt readings obtained from the recorder to shear strength in pounds per square inch. The millivolts were incremented by tenths from 0 to 500, generating the tabulation included as Appendix E. In order to use this tabulation, the amplifier gain must be adjusted as previously described so that four millivolts equals one inch-ounce of torque. The shear strength, in pounds per square inch units, is then obtained from the following relationships:

$$4 \text{ Millivolts} = 1 \text{ inch-ounce Torque}$$

$$\text{Torque (in-oz)} = \frac{\text{Recorder Reading (millivolts)}}{4}$$

To obtain the shear strength in inch-ounches, enter the above torque value in the shear strength equation, where the Vane Factor is given by $(\pi d^2 h/2 + d^3/6)$ for a particular size vane:

$$\text{Shear Strength (oz/in}^2\text{)} = \frac{\text{Torque (in-oz)}}{\text{Vane Factor (in}^3\text{)}}$$

The conversion of shear strength in ounces per square inch to pounds per square inch is:

$$\text{Shear Strength (psi)} = \text{Shear Strength (oz/in)} \times \frac{1}{16} \text{ (lb/oz)}$$

Combining terms results in the simple relationship below for determining shear strength in pounds per square inch from the recorder reading in millivolts and a given vane factor:

$$\text{Shear Strength (psi)} = \frac{\text{Recorder Reading (millivolts)}}{64 \times \text{Vane Factor}}$$

11. Recorder

Any quality recorder may be used in conjunction with the vane shear apparatus. The Hewlett-Packard 680 Strip Chart Recorder shown in Fig. 3 was used for all the tests of the present investigation.

12. Carrying Case and Calibration System

The carrying case shown in Fig. 21 was designed to house all components of the system except for the recorder. Mounting brackets and methods of securing all components to ensure that they are well protected were built into the carrying case. The calibration system has been incorporated in the carrying case. The system is arranged by attaching two arms with small pulleys to the top of the case, as is illustrated by Fig. 22. A calibration wheel is then attached to the other end of the transducer so as to permit a known torsional moment be be applied. Known weights are then tied to the end of a piece of lightweight fishing line and attached to the calibration wheel. These lines are passed over the small pulleys and the weights are allowed to hang free so as to apply a known torsional moment. The pulleys are ball-bearing mounted to eliminate friction. The output signal produced from this should now correspond to the reading of the known torque. If the amplifier gain has been properly adjusted by means of the "R Cal" feature as previously described to indicate four millivolts per inch-ounce of torque and if each weight suspended is five ounces, the total torque applied is ten inch-ounces. The output reading from the transducer should be 40 millivolts. A calibration curve was plotted using various weights to verify the linearity of the transducer when adjusted by means of the "R Cal" feature.

Figure 21: The NPS Vane Shear Apparatus components as stored in the carrying case

Figure 22: The NPS Vane Shear Apparatus calibration system as part of the carrying case

Experience has demonstrated that adjustment by the "R Cal" of the power supply and signal conditioning unit is very accurate. The calibration procedure is not necessary in the course of normal operation and need only be used in the event there is reason to believe that the resistive value of the "R Cal" circuit has changed.

B. TYPICAL VANE SHEAR RECORD

Figure 23 represents a typical continuous record for a cohesive marine sample tested with the NPS Vane Shear Apparatus. The curves shown are from the 3-6 inch interval of core 8 H. The lower curve is the original undisturbed sample and the upper curve indicates the loss of strength in the remolded sample. Both were tested using a 1/2 inch diameter by one inch high vane and with a ten millivolt scale setting on the strip chart recorder. The resulting shear strength was 0.276 pounds per square inch for the original and 0.068 pounds per square inch for the remolded sample. These values can be obtained by using the shear strength formula as shown previously or by utilizing the tables of Appendix E. According to Smith (1962), when using the NCEL Vane Shear Device, marine materials exhibit a flat crest on the curve from vane rotation angles of 27 to 38 degrees, and it is presumed that this interval represents failure of the cylindrical segment of soil. As evidenced by Fig. 23, the maximum reading occurs at about 18 degrees of vane rotation. Also, Fig. 23 shows that the curves do exhibit a flattened region; however, experience has demonstrated that this area usually occurs around 15 to 24 degrees of vane rotation with the NPS Vane Shear Apparatus. The difference between the NPS and the NCEL Vane Shear vane rotation angles at failure

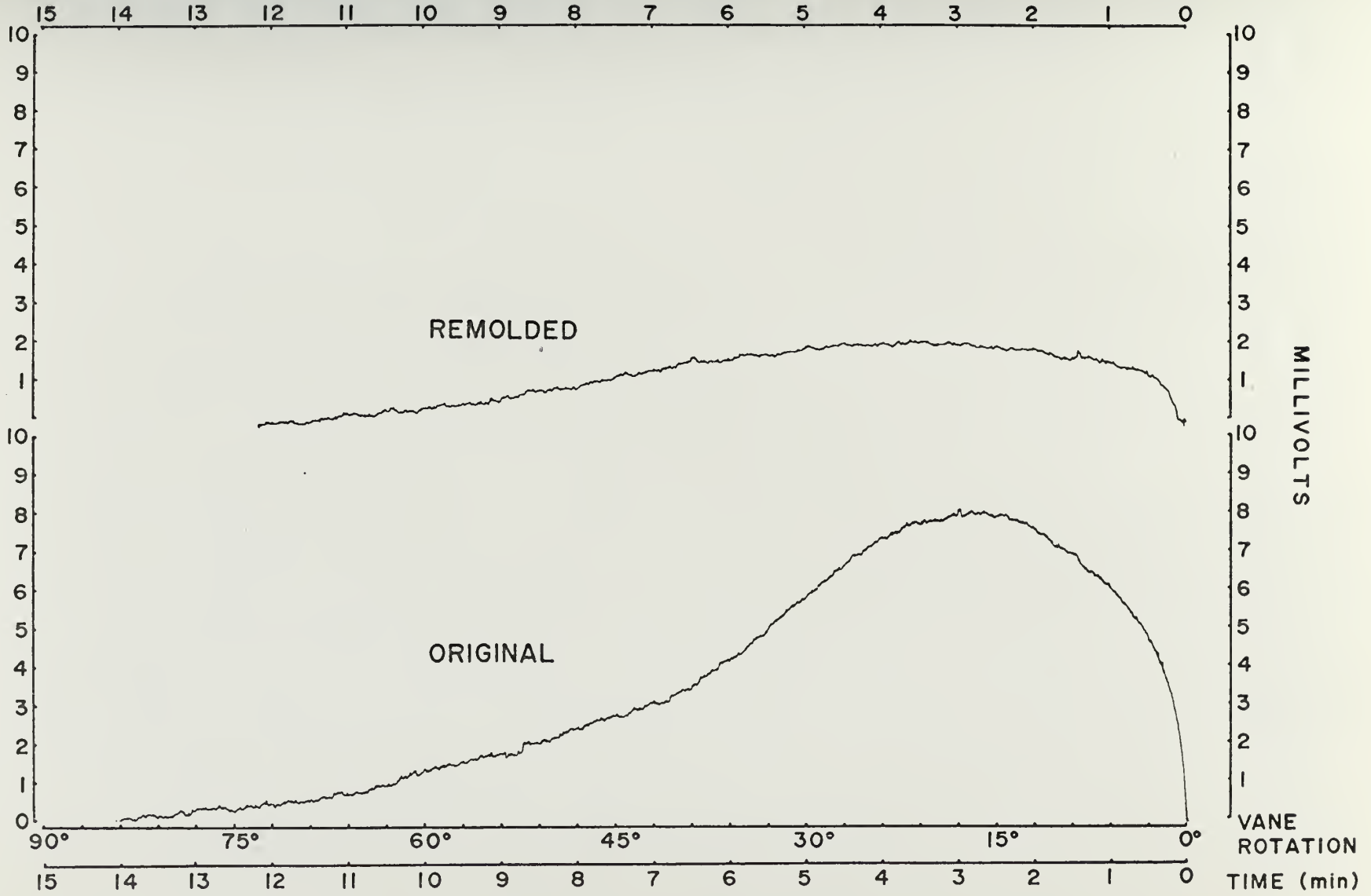


Figure 23: Typical continuous vane shear records produced by the NPS Vane Shear Apparatus

appears to be due to the bending of a flexible reed used by the NCEL apparatus; therefore, it does not indicate the true angle of failure.

IV. DEEP SEA SEDIMENT CORE INVESTIGATION

A. LOCATION

The deep sea sediment cores were taken aboard the USNS BARTLETT (T-AGOR-13) on 24 April 1970, in the vicinity of Guide Seamount. The core locations are shown on Fig. 24 and are also listed in Table 1. Figure 25, a precision fathometer profile of the ocean bottom depicting the seamount, was made during the coring program. The original intent was to position the BARTLETT northwest of the seamount, just beyond the 1700 fathom curve, and take deep sea cores as the ship drifted with the wind and currents across the seamount, at the same time obtaining a fathometer profile of the coring area. However, as is shown on Fig. 24 and Fig. 25, the coring track was not a straight line across the seamount as a result of the sea conditions. After core 4H was obtained, a two mile northeasterly transit was made in order to reposition over the summit of the seamount. The ship was again allowed to drift, this time holding a different heading in order to move in a more southeasterly direction.

B. CORES

The coring was done with a Ewing gravity corer with a ten foot long, 2-1/2 inch diameter core barrel incorporating a plastic liner and a brass core retainer with a 450 pound driving weight. After the cores were brought on board ship, the plastic liners were removed from the core barrel, capped, taped with plastic electrical tape, and stored in an upright position in a large barrel made from two 55 gallon oil drums. The barrel was filled with salt water so as to protect the cores from desiccation. The barrel and cores were then

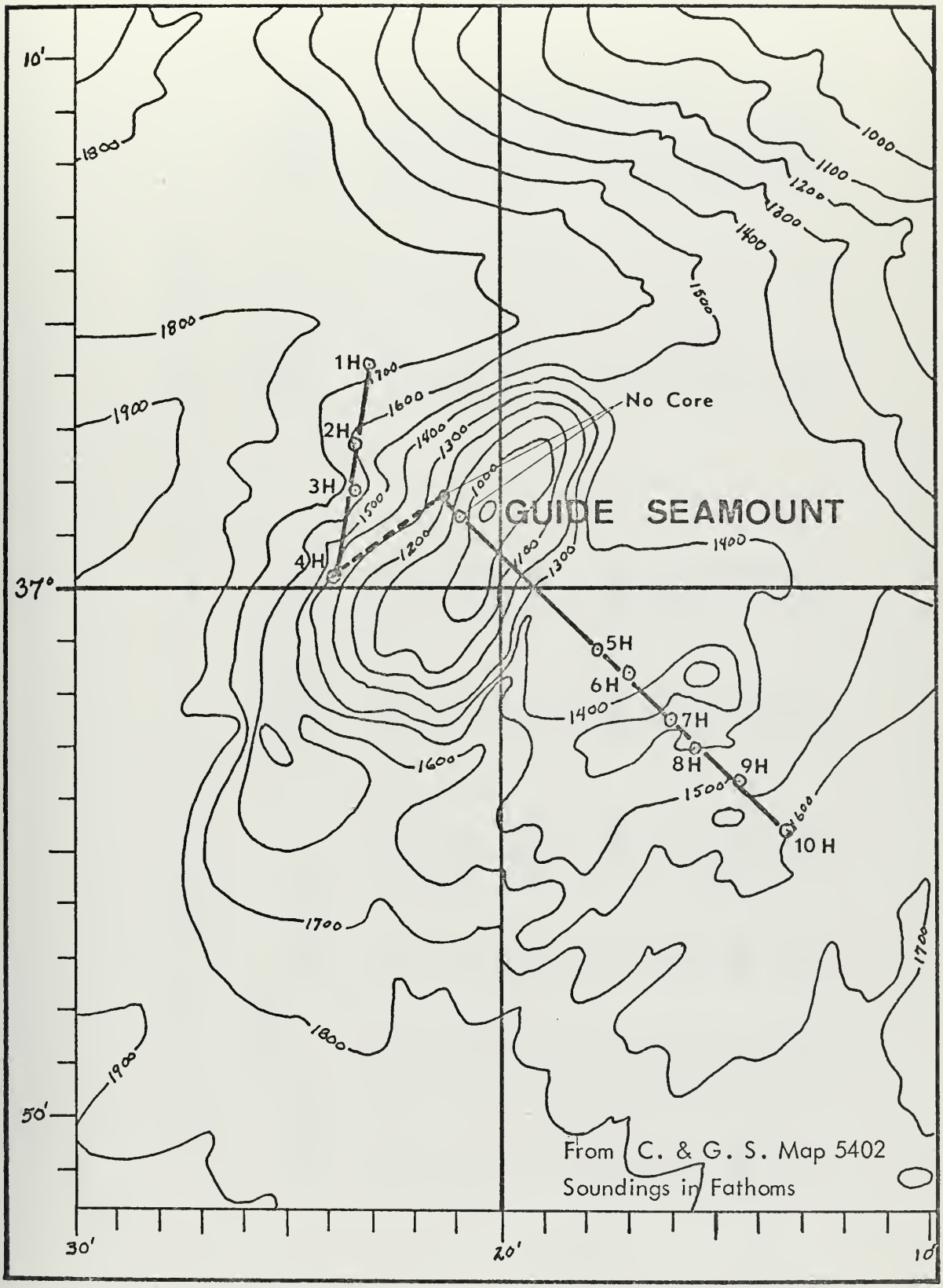


Figure 24: The track and location of the cores taken in the vicinity of Guide Seamount

TABLE 1: The location of cores taken in the vicinity of Guide Seamount

CORE NUMBER	LOCATION		WATER DEPTH		CORE LENGTH (inches)	DATE COLLECTED
	LATITUDE	LONGITUDE	FATHOMS	METERS		
1H	37° - 04.2'N	123° - 23.1'W	1760	3218	48-3/4	4/24/70
2H	37° - 02.7'N	123° - 23.5'W	1665	3042	42	4/24/70
3H	37° - 01.8'N	123° - 23.4'W	1570	2871	44	4/24/70
4H	37° - 00.2'N	123° - 24.0'W	1410	2578	54	4/24/70
No Core	37° - 01.7'N	123° - 21.4'W	1210	2213	0	4/24/70
No Core	37° - 01.3'N	123° - 21.1'W	1010	1847	0	4/24/70
5H	36° - 58.8'N	123° - 17.8'W	1385	2533	45	4/24/70
6H	36° - 58.4'N	123° - 17.2'W	1370	2505	60	4/24/70
7H	36° - 57.5'N	123° - 16.2'W	1390	2542	52-1/2	4/24/70
8H	36° - 57.0'N	123° - 15.6'W	1445	2642	54	4/24/70
9H	36° - 56.4'N	123° - 14.6'W	1495	2734	57	4/24/70
10H	36° - 55.4'N	123° - 13.4'W	1600	2924	48	4/24/70

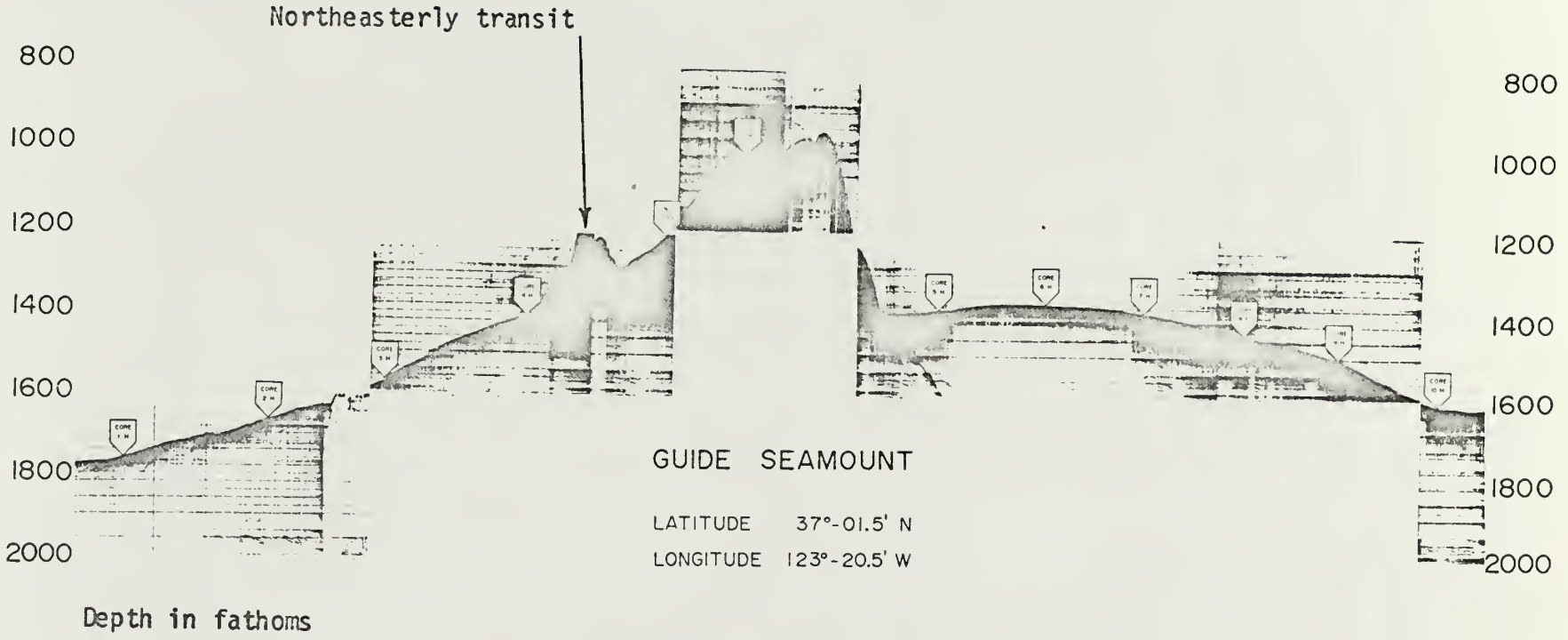


Figure 25: The precision fathometer profile made during the coring evolution across the Guide Seamount

transported back to the laboratory and stored until the testing could be done.

As indicated by Fig. 24 and Fig. 25, no cores were obtained on or near the top of the seamount. In two attempts, when the corer was brought on board ship, the cutter was badly scarred and chipped. The wire was also fouled around the fins of the corer and appeared as if it had rebounded on hitting the bottom. This failure to obtain cores in this area is probably because of the igneous rocks atop this volcanic seamount (Uchupi and Emery, 1961).

C. ENGINEERING PROPERTIES

A brief description of the engineering properties studied in this investigation are presented in Appendix B. The significance of the terms is considered in standard texts on soil mechanics. The following properties of the Guide Seamount cores were examined:

a. Shear Strength
b. Remolded Strength
c. Sensitivity
d. Bulk Wet Density
e. Water Content
f. Specific Gravity Solids
g. Dry Density
h. Void Ratio
i. Porosity

D. LABORATORY TEST SEQUENCE

The laboratory examination of the cores from the Guide Seamount region was conducted on three inch test interval sections. The sequence of testing was performed in the following manner, after the

NPS Vane Shear Apparatus had been calibrated by using the procedure previously outlined. A core was selected and the number, length, location and any other pertinent remarks were noted. Using the NPS Vane Shear Apparatus, the vane shear test was conducted with the following procedure: A vane size and recorder setting was determined with the aid of Appendix E by first estimating the approximate shear strength of the sample to be tested. The sample was then placed in the core holding bracket shown in Fig. 3 and the vane was lowered into the sample so that the top of the vane was 3/4 inch below the sample surface. The top and bottom lock-nuts shown in Fig. 14 were secured against the guide bracket. The strip chart recorder zero was then adjusted to a convenient reference line and the recorder advance was set at the desired speed. The advance of one inch per minute correlated well with the six degrees of vane rotation per minute provided by the vane shear motor and was therefore used in most cases. The vane shear motor was started when a reference line on the chart paper passed under the pen. The test was continued until a definite peak occurred on the recorder record, which was normally between 15 and 24 degrees of vane rotation. The shear strength in pounds per square inch was obtained from Appendix E by entering with the peak value of the record in millivolts and the size of the vane used. The shear strength may also be calculated by using the shear strength equation. Upon completion of the vane shear test, a small stainless steel sleeve of known weight and volume (Fig. 26) was inserted into an undisturbed portion of the sample to obtain a specimen for the bulk wet density determination. The sleeve with its sample was removed and weighed, with the results recorded on the appropriate

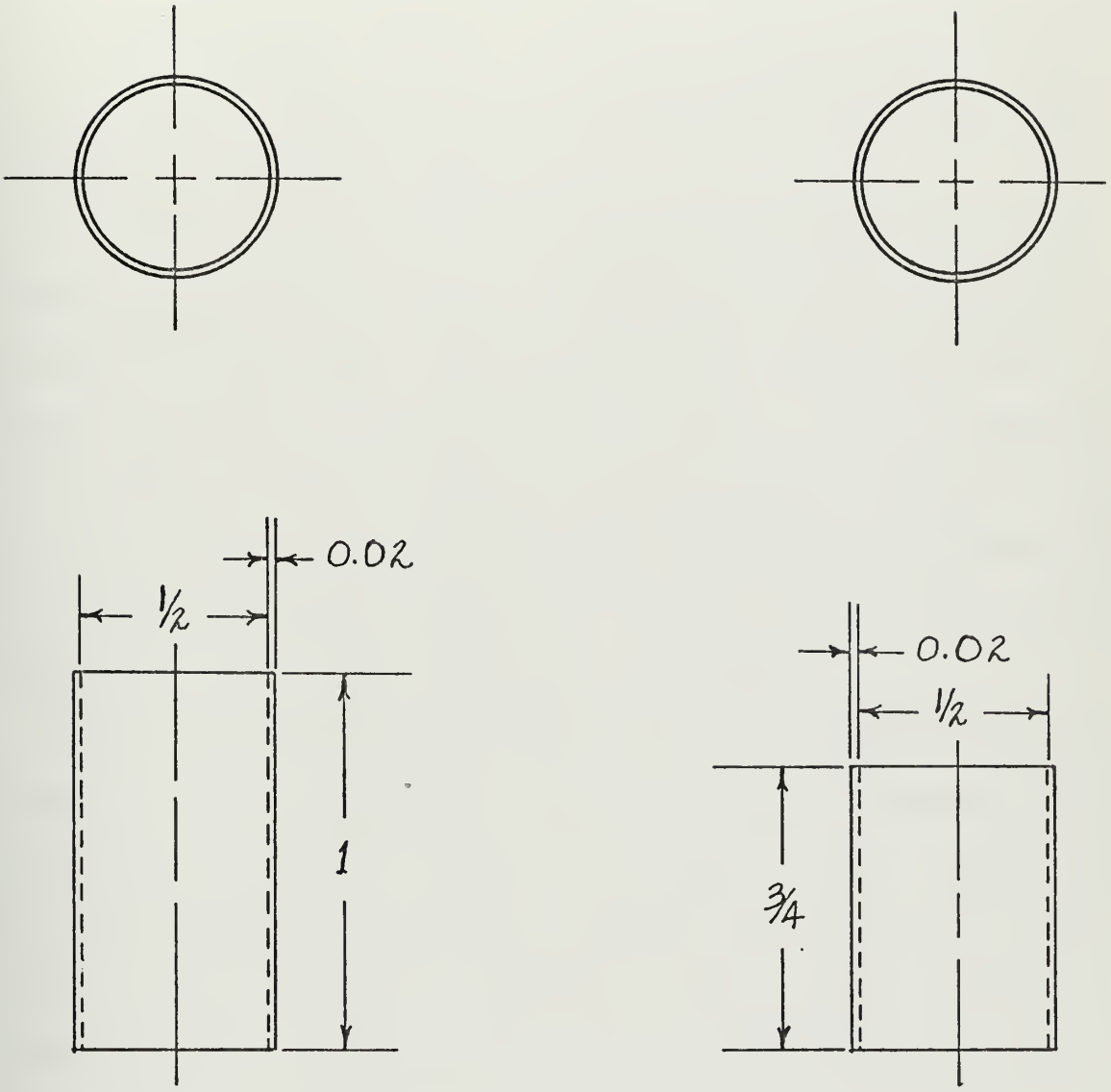


Figure 26: Detail drawing of the stainless steel sleeves manufactured for bulk wet density determination

worksheet, an example of which is shown in Fig. 27.

After the core was removed from the core holding bracket, a three inch section of the core liner was cut from the core by using a soldering gun, as illustrated by Fig. 28. This procedure is described in detail by Smith and Nunes (1963). The sediment portion of the core was cut with a piano wire blade coping saw, also shown in Fig. 28, and the remainder of the core was again sealed.

The water content was obtained by taking approximately a 25 gram sample from the top of each section tested and placing it in a small container of known weight. The container and the sample were then weighed immediately and placed in an oven held at a constant temperature of 110 degrees centigrade. After a 24 hour period, the sample container was removed from the oven, allowed to cool approximately two minutes, and then reweighed. The water content was calculated from the ratio of the weight of the water to the dry weight of the sample.

After removal of the water content sample, the remainder of the section was extruded into a plastic bowl where it was cut lengthwise with a small spatula to note the lithology. The sample was then remolded with the small spatula for approximately one minute and placed into a three inch core liner section with a bottom cap. The remolded strength was then determined in the same manner as the original by using the vane shear apparatus.

E. CALCULATIONS

The example worksheet shown in Fig. 27 exhibits the calculations performed for each sample tested. The results were then transferred to the core summary sheets in Appendix D. This data was then examined and evaluated with the aid of Appendix C and the various figures and tables included in this report.

CORE NO 10H INTERVAL 45 IN TO 48 IN LAT: 36-55.4N LONG: 123-13.4W WATER DEPTH 1600 fath

OPERATOR J. R. HECK COLOR 5 GY 3/2

DATE 8/2/70 ODOR H_2S

REMARKS NONE

BULK WET DENSITY

CONTAINER NO	1	
WT CONT + SAMPLE	6.22	gm
WT CONT	2.98	gm
WT SAMPLE	3.24	gm
VOL CONT	2.43	cc

$BWD = \frac{WT\ SAMPLE}{VOL\ SAMPLE} = 1.334$ gm/cc

ORIGINAL WATER CONTENT

CAN NO	70	
WT CAN	18.02	gm
WET WT + CAN	46.78	gm
DRY WT + CAN	29.54	gm
WT WATER	17.24	gm
DRY WT	11.52	gm

$WC = \frac{WT\ WATER}{DRY\ WT} \times 100 = 150$ %

VANE SHEAR STRENGTH

VANE DIAMETER 0.5 IN. VANE HEIGHT 1.0 IN

VANE FACTOR 0.45813

$SHEAR\ STRENGTH = \frac{MILLIVOLTS}{64 \times VANE\ FACTOR} = \frac{7.0}{64 \times 0.45813} = 0.239$ PSI

$REMOLDED\ STRENGTH = \frac{MILLIVOLTS}{64 \times VANE\ FACTOR} = \frac{2.5}{64 \times 0.45813} = 0.0854$ PSI

$SENSITIVITY = \frac{ORIGINAL}{REMOLDED} = 2.80$

$SPECIFIC\ GRAVITY = \frac{BWD}{1 + \frac{WC}{100} - \frac{(BWD \times WC)}{100}} \quad \frac{1.334}{1 + \frac{150}{100} - \frac{(1.334 \times 150)}{100}} = 2.65$

$DRY\ DENSITY = \frac{BWD}{1 + \frac{WC}{100}} = \frac{1.334}{1 + \frac{150}{100}} = \frac{1.334}{2.50} = 0.534$ gm/cc

$VOLUME\ SOLIDS = \frac{DRY\ DENSITY}{SP\ GR} = \frac{0.534}{2.66} = 0.200$ cc

VOLUME VOIDS = 1.000 - VOL SOLIDS 1.000 - 0.200 = 0.800 cc

$VOID\ RATIO = \frac{VOL\ VOIDS}{VOL\ SOLIDS} = \frac{0.800}{0.200} = 4.00$

$POROSITY = \frac{VOL\ VOIDS}{TOTAL\ VOL} \times 100 = \frac{0.800}{1} \times 100 = 80$ %

$SATURATED\ VOID\ RATIO = \frac{SP\ GR \times WC}{100} = \frac{2.65 \times 150}{100} = 4.0$

Figure 27: The type of worksheet that was used in the data reduction of the Guide Seamount cores

Figure 28: A demonstration of the soldering gun technique for cutting plastic core liners

F. RESULTS

The sediments of each core consisted predominately of a grayish-green clayey mud with a uniform color designation of 5 GY 3/2 (Geological Society of America, 1951). Cores 6H, 7H, 8H, and 9H exhibited areas and layers of sand size material which were considerably more gritty in comparison to the rest of the core. The majority of this grittiness was attributed to larger tests within the pelagic sediments, with only about ten percent attributed to true sand grains. The tests were of both calcareous and siliceous derivation, the most prevalent observed being Foraminifera, diatoms and radiolarians. Mica was observed as the main component of the small amount of terrigenous mud, with a very slight trace of olivine also being detected (R. S. Andrews, personal communication). These more sandy areas served as the only real contrasting difference between the cores taken from the two sides of the seamount. The coarser areas were slightly darker in color than was the mud; however, the significance of this color dissimilarity was not considered sufficient to warrant a different color designation. The sediment exhibited a definite hydrogen sulfide odor throughout, but, according to Smith and Hironaka (1964), such odors are usually not a significant characteristic feature and depend both on the period of storage prior to testing and the experience and judgment of the recording technician. There were no large shells visible to the unaided eye in any of the cores.

1. Shear Strength

It is well established that the shear strength of normally consolidated soils increases with depth. This vertical variation of strength or cohesion with depth, shown in Figs. 29, 30, and 31, was

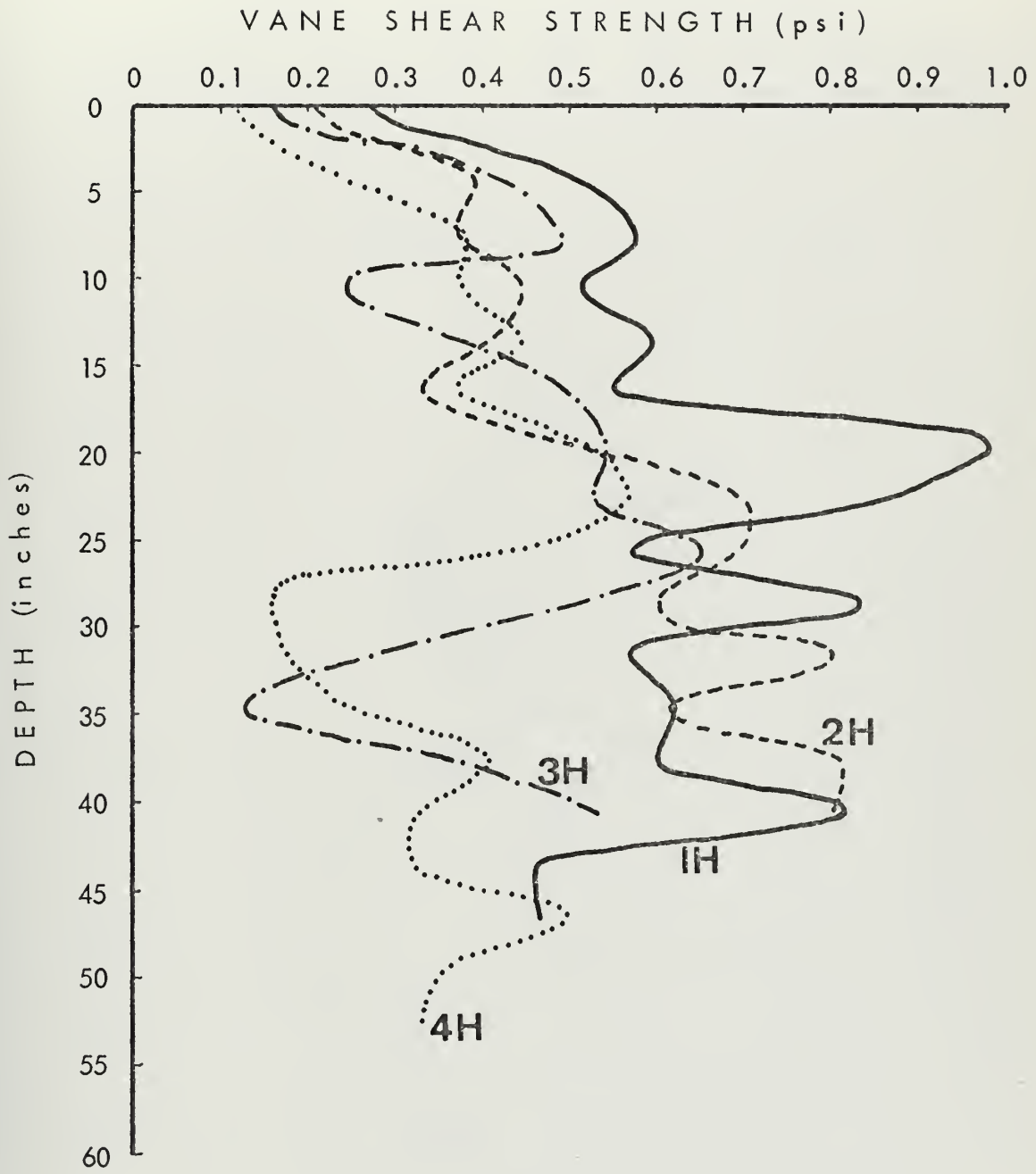


Figure 29: The variation of vane shear strength with depth for Guide Seamount cores 1 H through 4 H

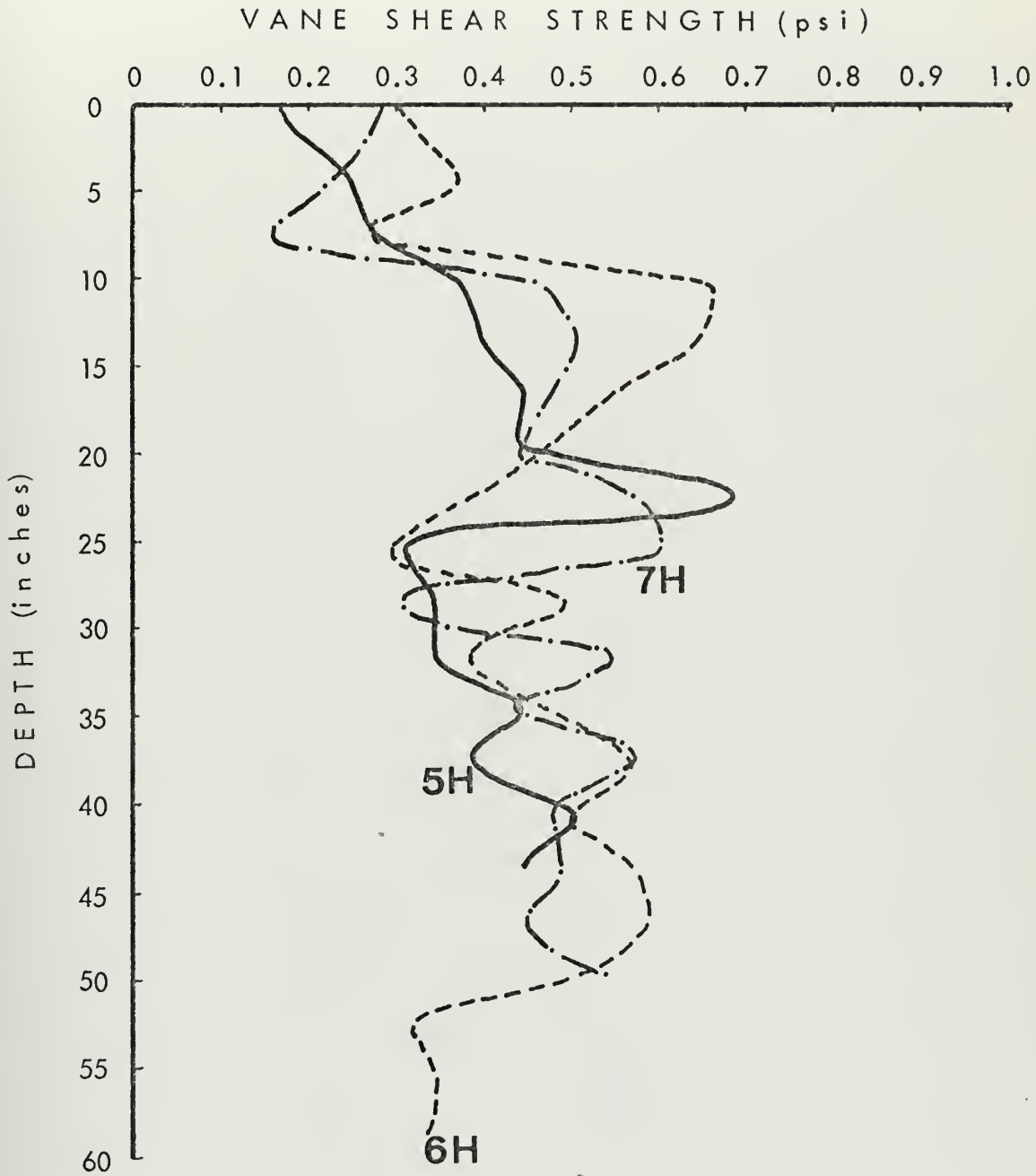


Figure 30: The variation of vane shear strength with depth for Guide Seamount cores 5 H through 7 H

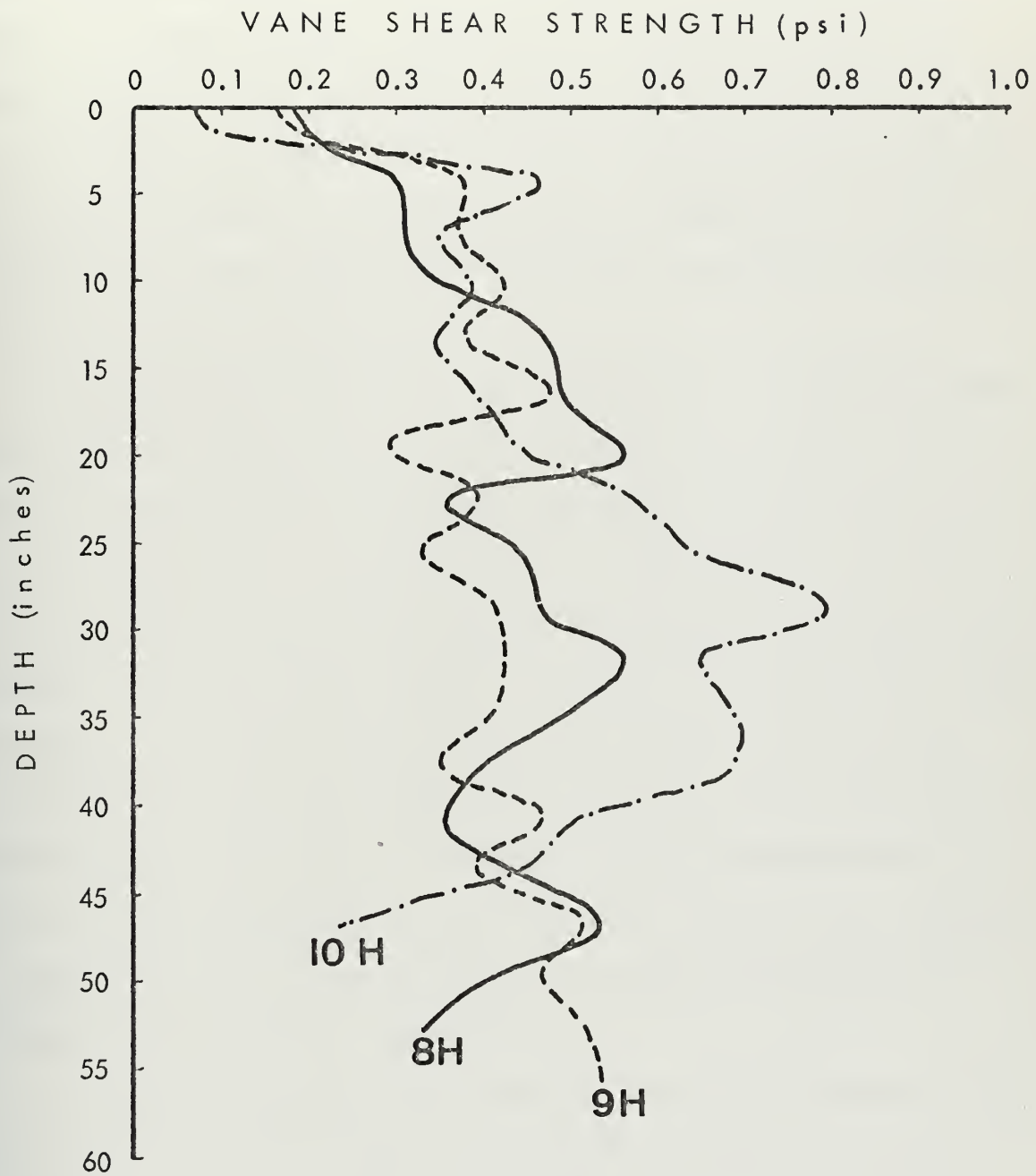


Figure 31: The variation of vane shear strength with depth for Guide Seamount cores 8 H through 10 H

found to be far less consistent that either the bulk wet density or water content patterns. This may be attributed to the deposition of layers of varying character. According to Inderbitzen (1969), there was no direct correlation between rates of strength increase or water content decrease and sedimentation rates in the recent marine sediments off Southern California. In that grain size and composition were not determined for these samples, the basic reason for the shear strength variability was not determined.

Sediment shear strength includes both friction and cohesion terms and is primarily dependent upon the bulk density or packing. Electrostatic attraction between particles at boundaries in contact generally accounts for cohesion. The void ratio of a sediment would be decreased by more closely packed particles and the tighter packed particles would increase the attraction and cohesion. According to Hough (1957), internal friction is a function of the interlocking of grains as well as their frictional resistance to sliding, and is directly related to the bulk density of a granular material. Inderbitzen (1969) demonstrated an inverse relationship between the void ratio and the log of shear strength. A random check of the core results also confirmed such an inverse relationship in the present investigation.

The shear strengths of the sediments from the Guide Seamount region were found to range from 0.082 to 0.990 pounds per square inch, as shown in Table 2, with an average at the sediment surface of about 0.19 increasing to about 0.5 pounds per square inch two to three feet below the surface. With the exception of core 1H and 6H, all cores exhibit strengths of less than 0.5 pounds per square inch within their uppermost foot.

The values of shear strength of each test interval for all ten cores were plotted as data points on Fig. 32. Although not well defined,

TABLE 2 : The minimum and maximum values of vane shear strength measured in the Guide Seamount cores

VANE SHEAR STRENGTH (psi)

	REMOLDED		ORIGINAL	
CORE	MIN	MAX	MIN	MAX
1H	0.089	0.375	0.311	0.990
2H	0.055	0.245	0.232	0.802
3H	0.041	0.147	0.123	0.649
4H	0.048	0.109	0.133	0.570
5H	0.055	0.181	0.181	0.684
6H	0.072	0.147	0.270	0.663
7H	0.048	0.127	0.154	0.600
8H	0.048	0.133	0.201	0.560
9H	0.068	0.155	0.178	0.529
10H	0.050	0.161	0.082	0.795

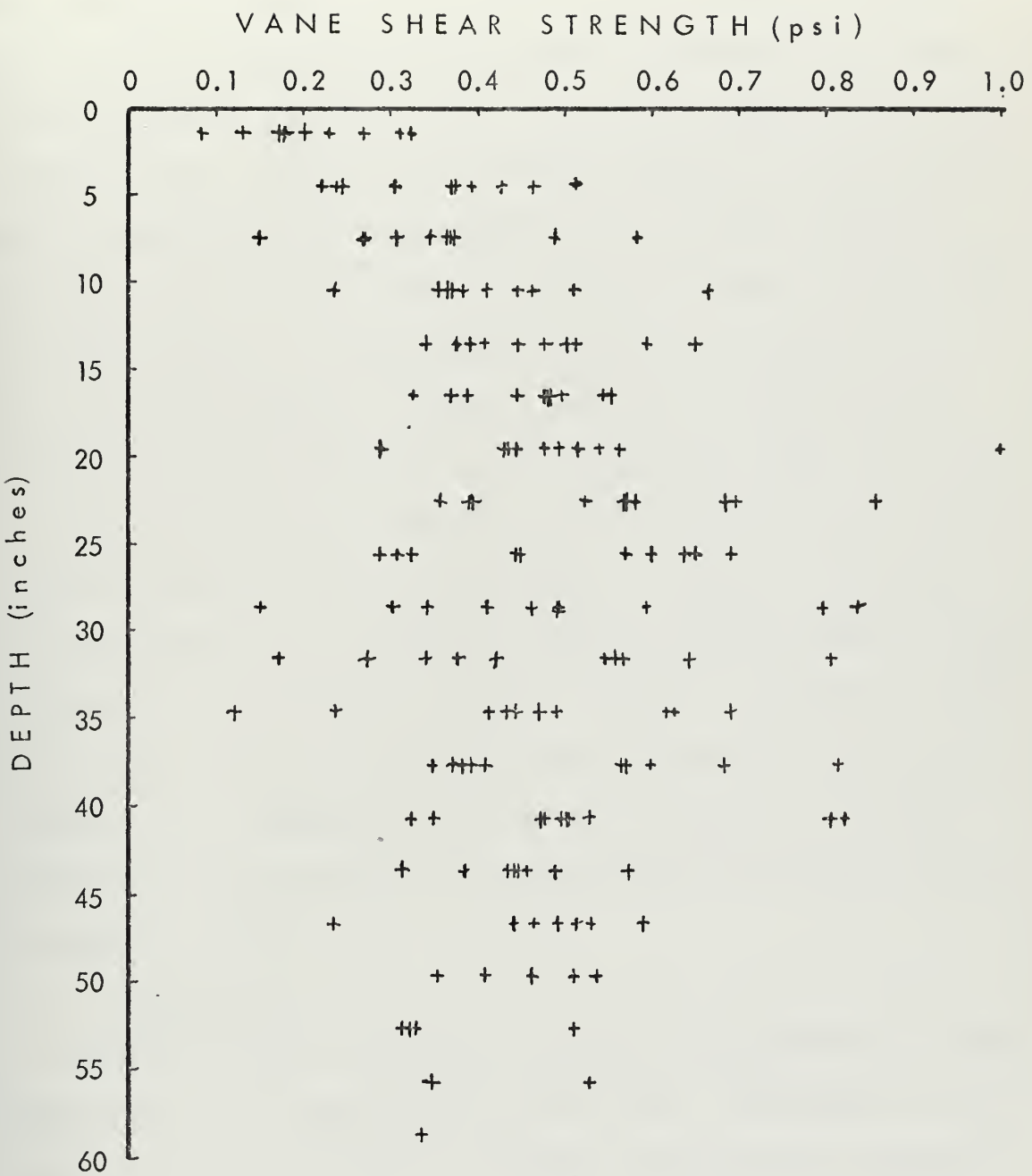


Figure 32: The shear strength test interval data points for the ten Guide Seamount cores plotted as a function of depth

the distribution does have a pattern. Examining these data points and plotting the frequency of occurrence for their shear strengths, as in Fig. 33, a statistical range appears with the greatest number of shear strengths between 0.3 and 0.6 pounds per square inch. Examination of these individual shear strength ranges as in Fig. 34, 35, and 36, demonstrates a wide distribution over the entire depth of the cores. The 0.3 to 0.4 pounds per square inch shear strength range is slightly skewed. By superimposing these three diagrams, as in Fig. 37, an inconsistency is noted in the depth interval of 24 to 27 inches. Comparing this drop in data points with those in Fig. 32, it is seen that the shear strength drops off in this interval and then increases again with depth. The absence of strength in the interval just described can also be noted by examining the core summary diagrams of Appendix C. There is no significant increase in the water content or decrease in the bulk density that would account for this loss in strength. It is suggested that perhaps this feature is related to disturbance induced during the corer penetration and retrieval during the sampling process.

2. Sensitivity

In some instances, a means of estimating the possibility of sample disturbance is by a measurement of sensitivity. The greater the sensitivity, the larger the loss of strength in the completely disturbed or remolded condition. Since sensitivity is also a function of the compositional character of the sediments, the amount of disturbance in these cores could not be defined specifically because the composition of these samples was not determined. In general, the remolded strength of the cores tested in this investigation was approximately one-third

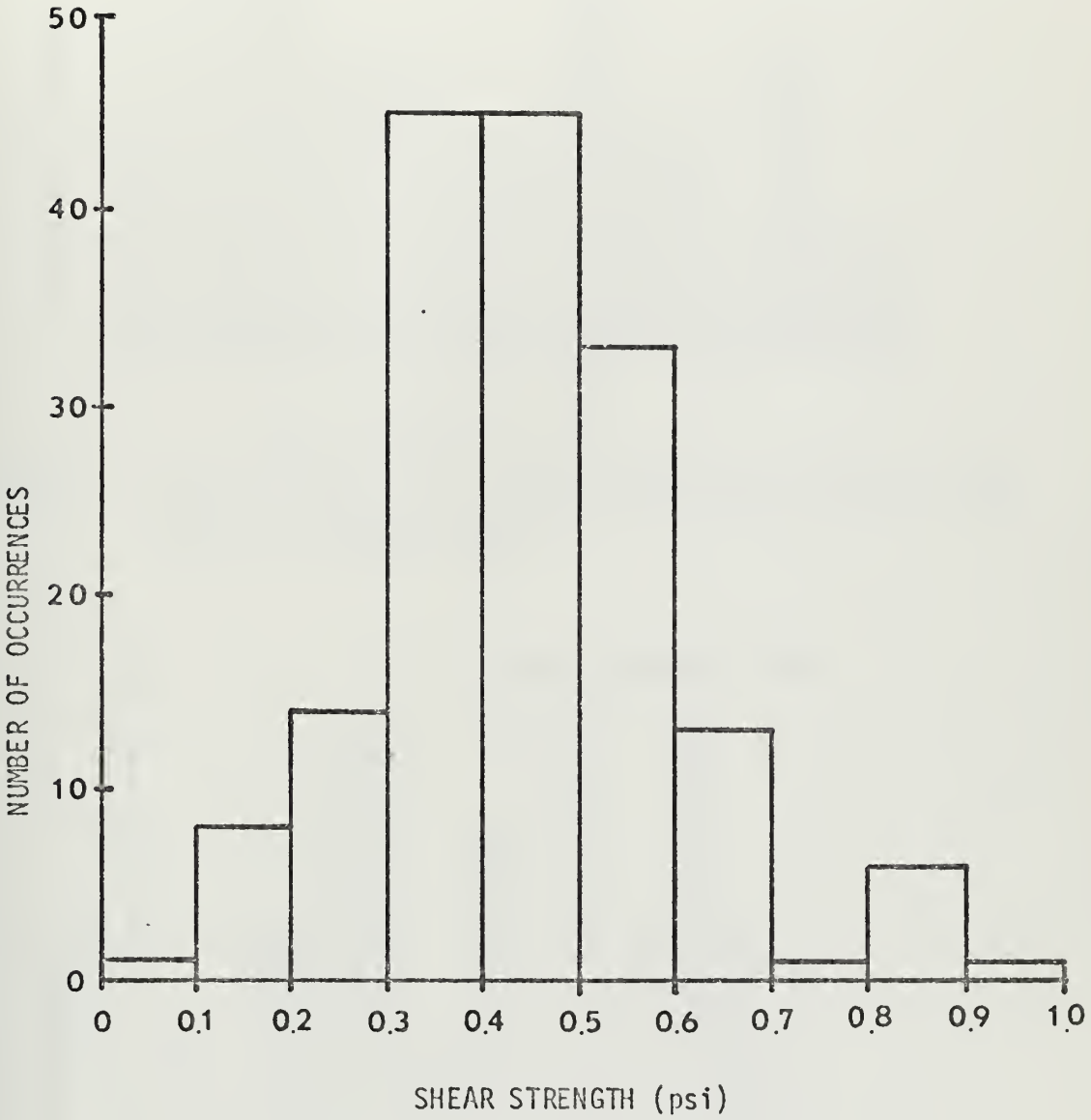


Figure 33: The frequency of occurrence of the shear strength test interval data points of the ten Guide Seamount cores

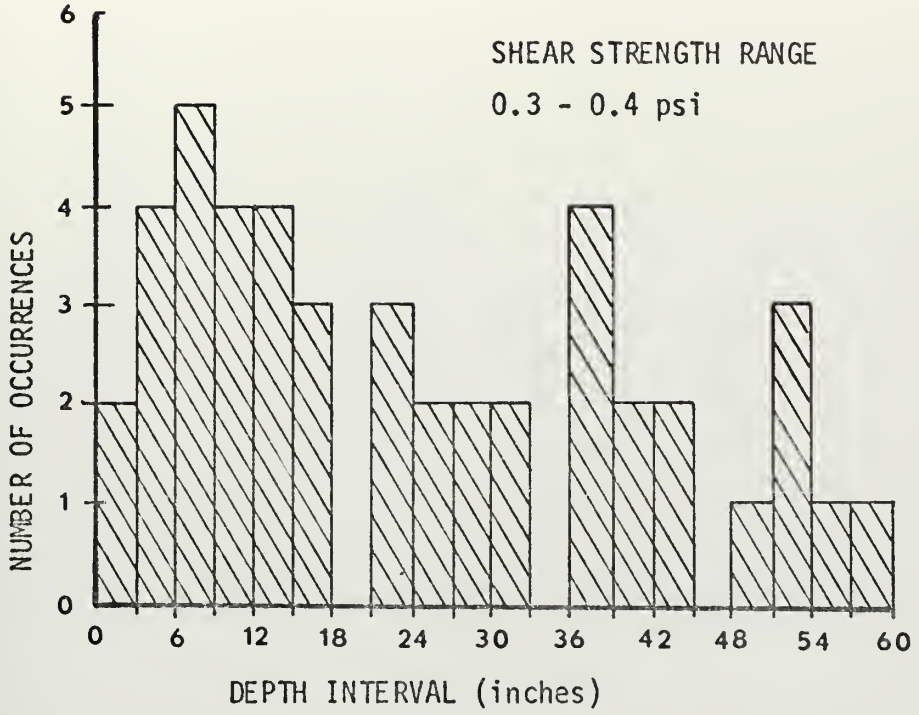


Figure 34: The frequency of occurrence of the shear strength test interval data points ranging from 0.3 - 0.4 psi of the ten Guide Seamount cores

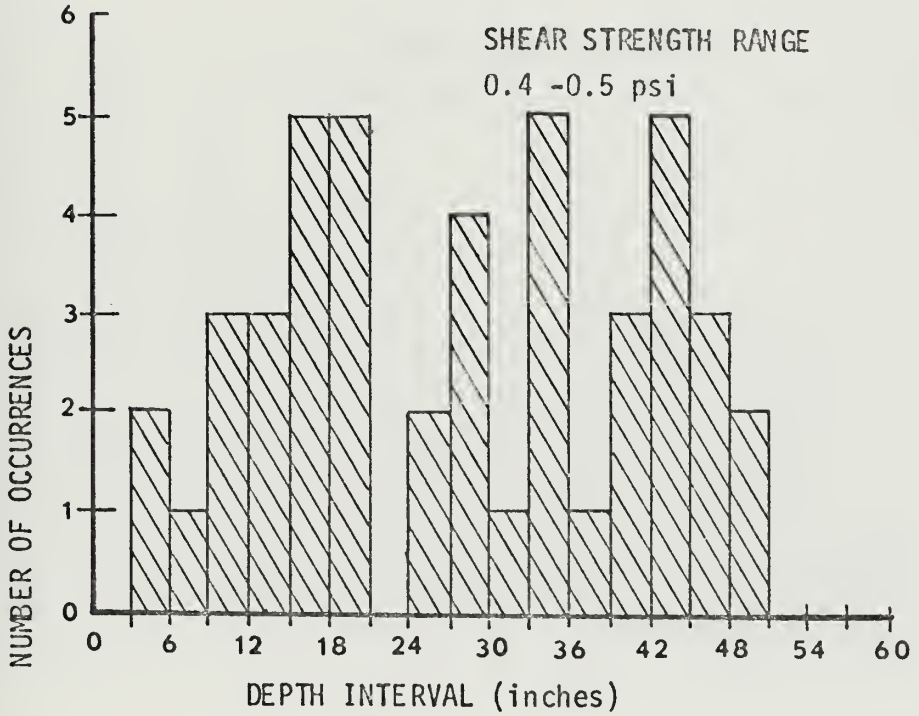


Figure 35: The frequency of occurrence of the shear strength test interval data points ranging from 0.4 - 0.5 psi of the ten Guide Seamount cores

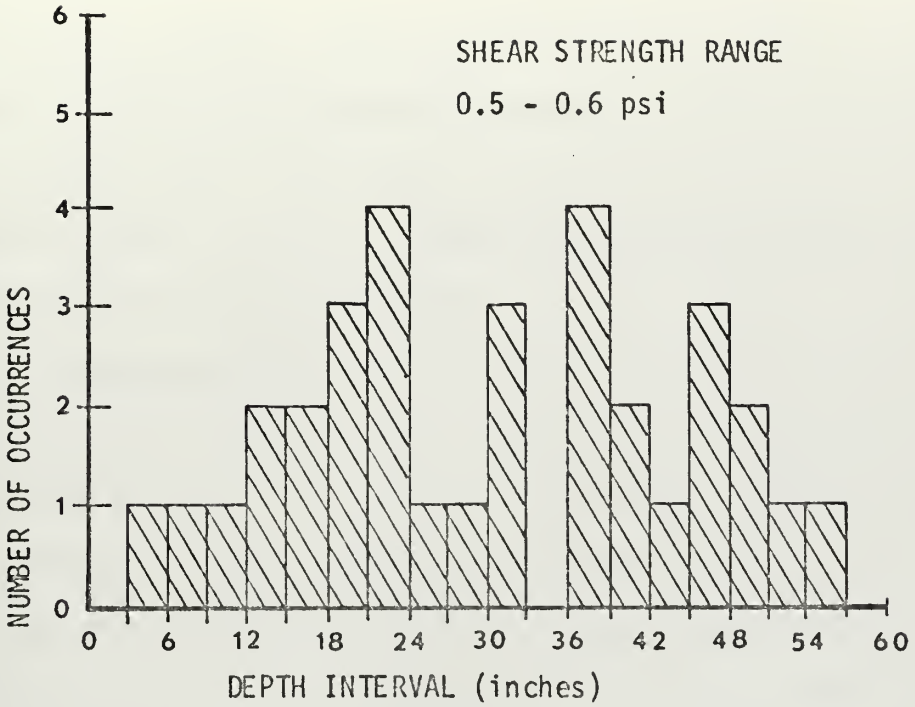


Figure 36: The frequency of occurrence of the shear strength test interval data points ranging from 0.5 - 0.6 psi of the ten Guide Seamount cores

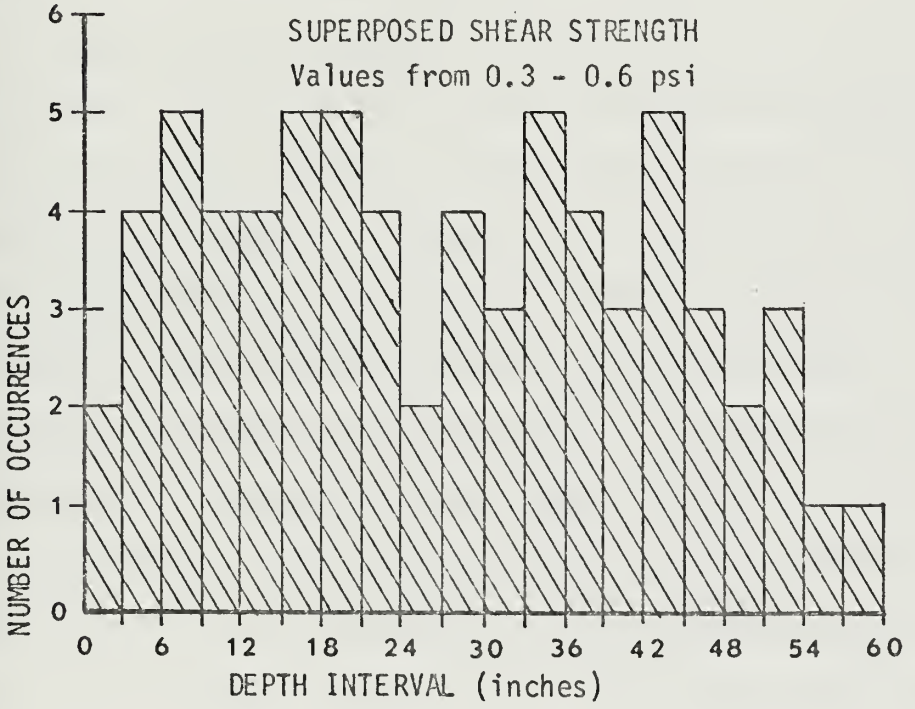


Figure 37: The superposition of Figures 34, 35, and 36, frequency of occurrence of the shear strength test interval data points ranging from 0.3 - 0.6 psi of the Guide Seamount cores

the original strength. Using the classification system of Rosenquist (1953), the sensitivity therefore ranged from slightly insensitive to very sensitive soil. The range of sensitivity values for the cores tested are given in Table 3. Appendix D contains a complete listing of the sensitivity values computed.

3. Bulk Wet Density

The bulk wet density shows a slight linear increase with depth, as illustrated by Figs. 38, 39 and 40. The overall range was from 1.16 to 1.73 grams per cubic centimeter, as shown in Table 4. The minimum value was from the 0-3 inch interval of core 7H and the maximum value, as evidenced by Fig. 40 and Appendix C, was in the "sand" layer in the 48-51 inch interval of core 8H. It is also noted in Appendix C that all of the high bulk wet density areas were associated with "sand" regions and zones of low water content.

4. Original Water Content

The water content exhibits a general decrease with depth, as shown in Figs. 41, 42 and 43, with a few low values occurring in the regions of high bulk wet density. As previously noted, these areas were related to the coarser grained material. Zones of high water content at depth were associated with cracks or voids in the core, as evidenced by core 3H in Appendix C, and these areas also exhibited low shear strength values. The water content ranged from 55.6 to 251 percent, as shown in Table 5. The low water content value was from the coarser layer in the 48-51 inch interval of core 8H and the high value from the 0-3 inch interval of core 1H. All of the cores tested revealed a water content of 190 percent or greater in the uppermost three inches, as shown in Appendices C and D.

TABLE 3 : The minimum and maximum sensitivity values calculated for Guide Seamount cores

SENSIVITY

CORE	MIN	MAX
1H	2.07	5.23
2H	2.96	5.32
3H	2.25	7.78
4H	2.19	7.95
5H	2.65	5.00
6H	2.93	6.02
7H	1.81	7.64
8H	2.91	6.91
9H	2.61	6.75
10H	1.65	6.05

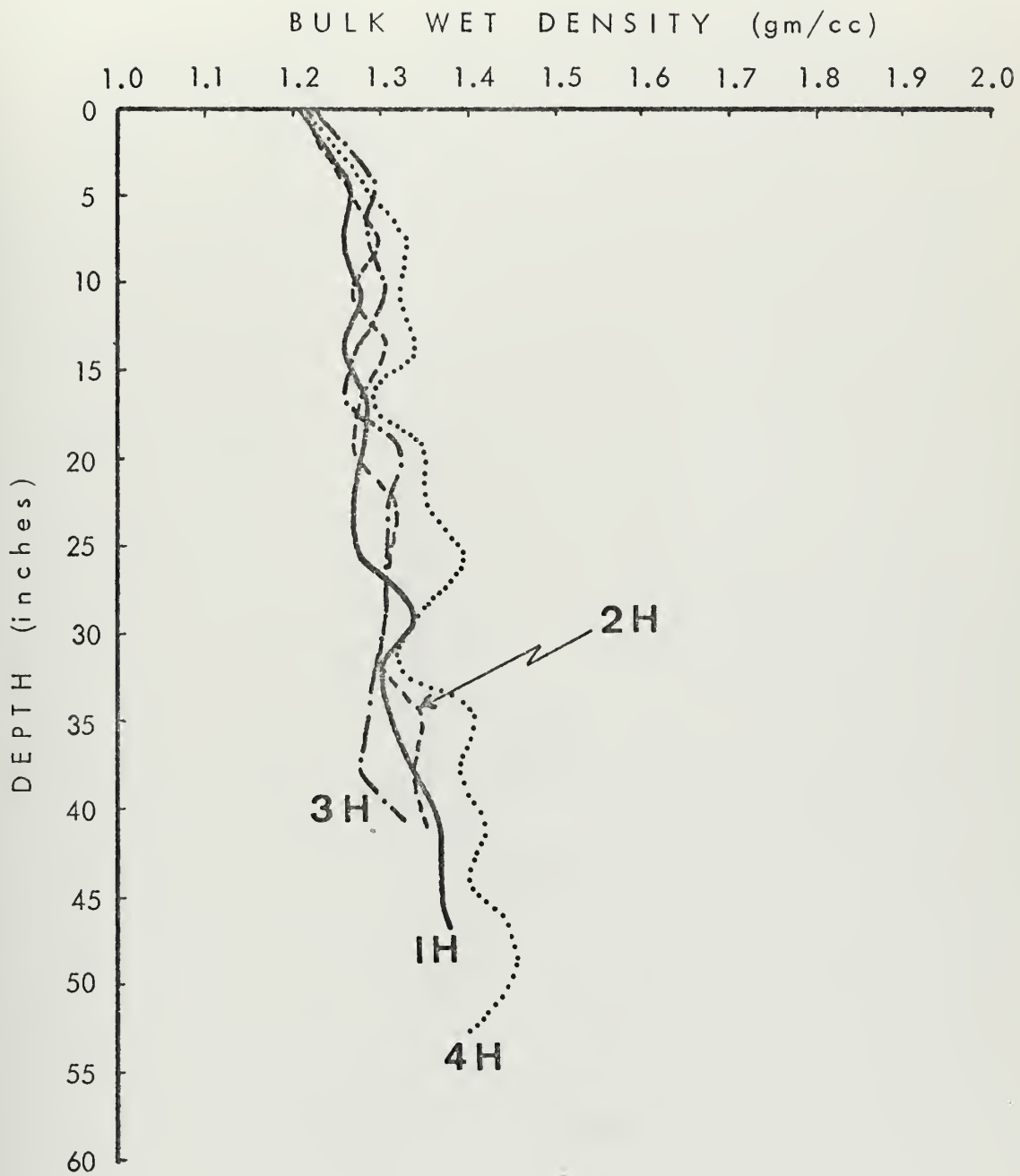


Figure 38: The variation of bulk wet density with depth for Guide Seamount cores 1 H through 4 H

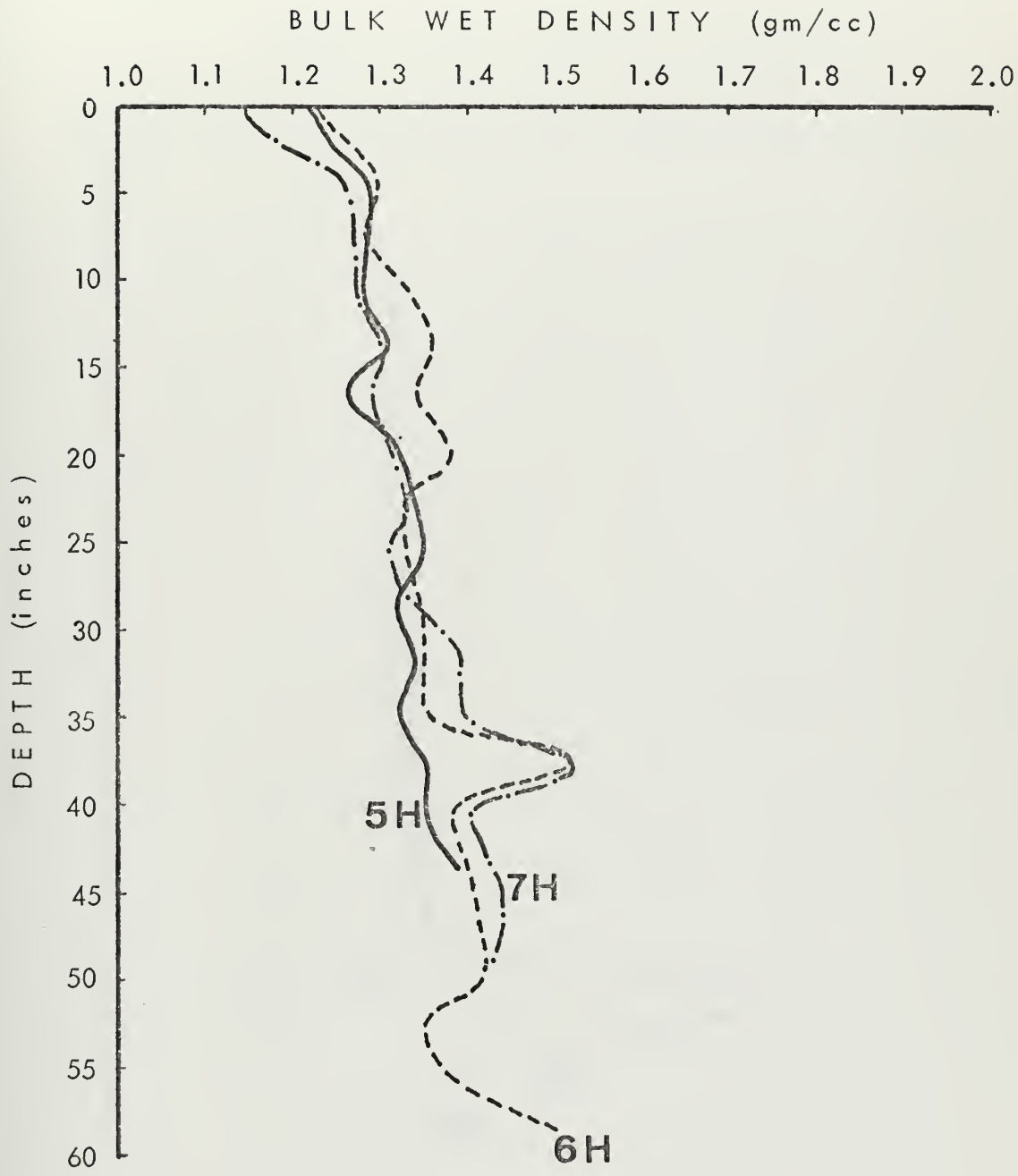


Figure 39: The variation of bulk wet density with depth for Guide Seamount cores 5 H through 7 H

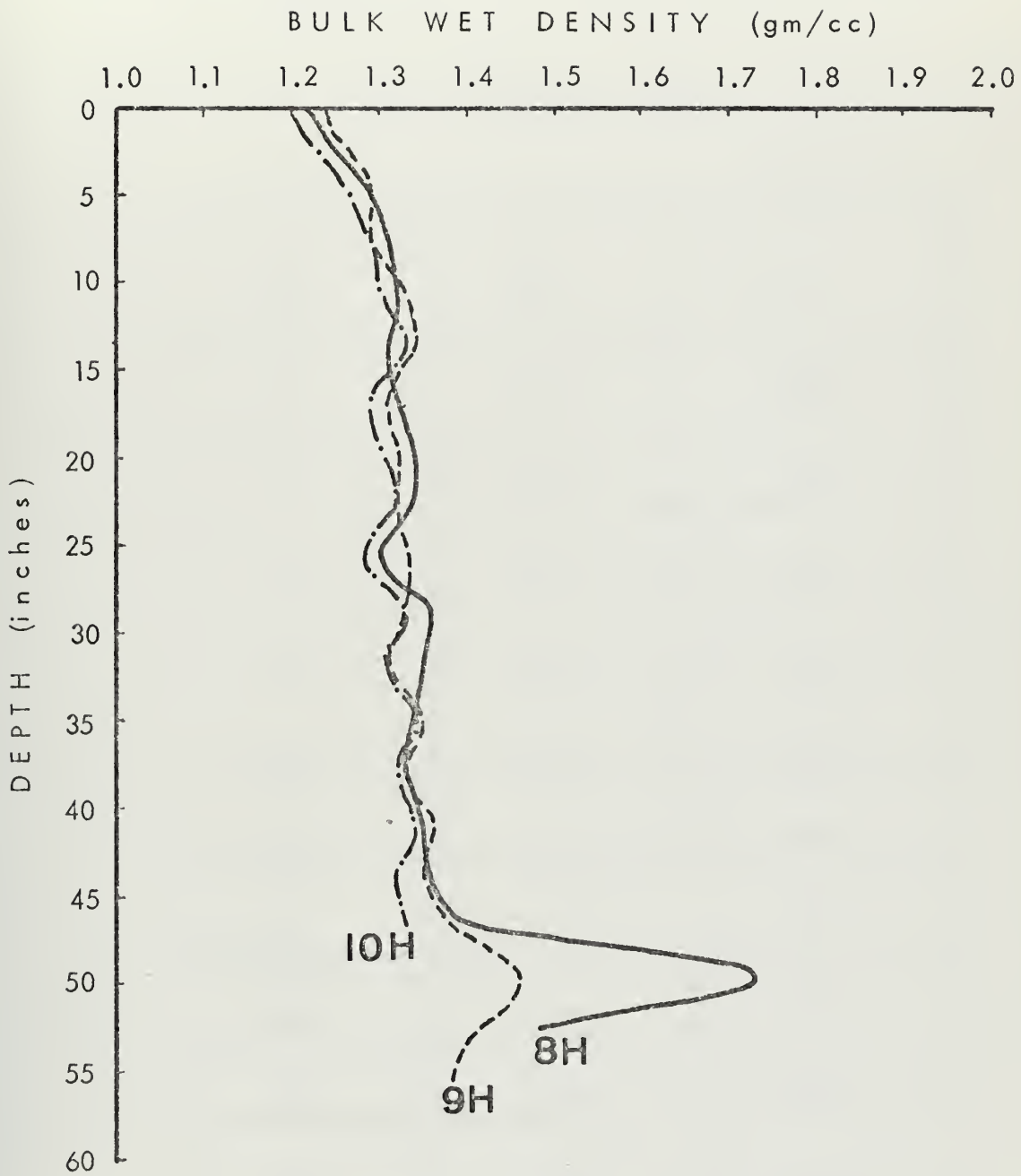


Figure 40: The variation of bulk wet density with depth for Guide Seamount cores 8 H through 10 H

TABLE 4: The minimum and maximum values of bulk wet density determined for Guide Seamount cores

BULK WET DENSITY (gm/cc)

CORE	MIN	MAX
1H	1.23	1.38
2H	1.23	1.35
3H	1.25	1.33
4H	1.25	1.45
5H	1.24	1.39
6H	1.25	1.52
7H	1.16	1.52
8H	1.24	1.73
9H	1.25	1.46
10H	1.21	1.34

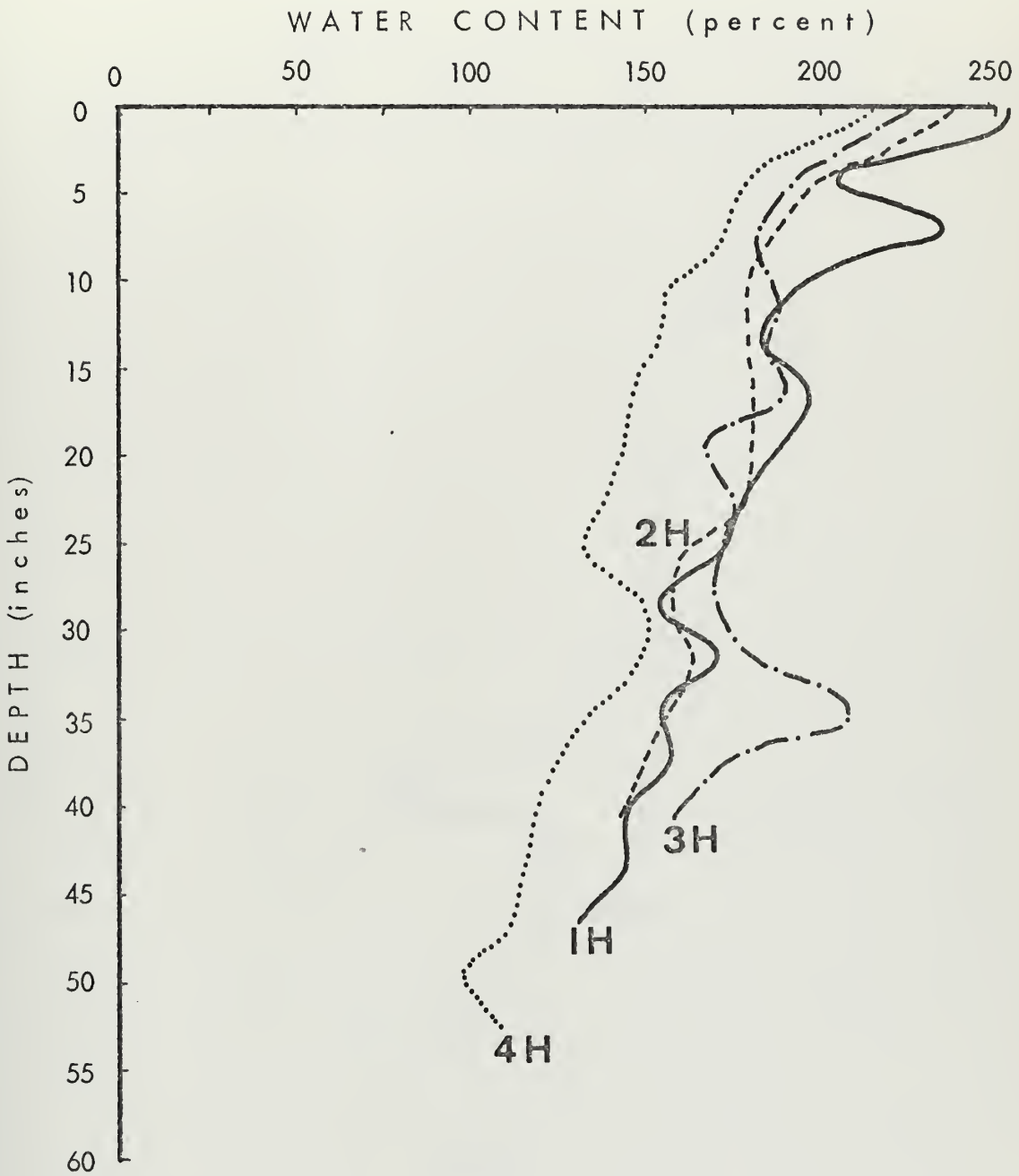


Figure 41: The variation of original water content with depth for Guide Seamount cores 1 H through 4 H

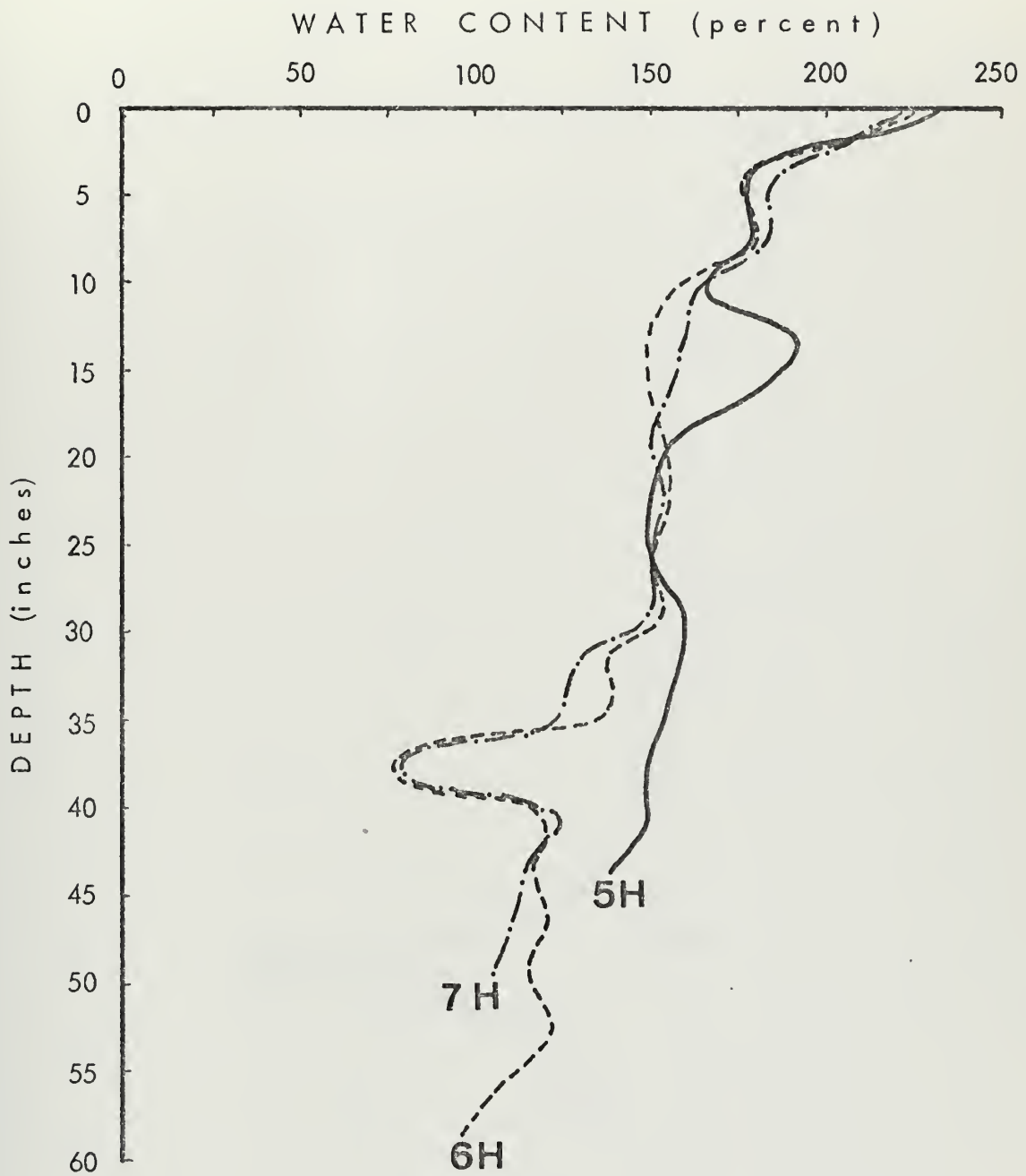


Figure 42: The variation of original water content with depth for Guide Seamount cores 5 H through 7 H

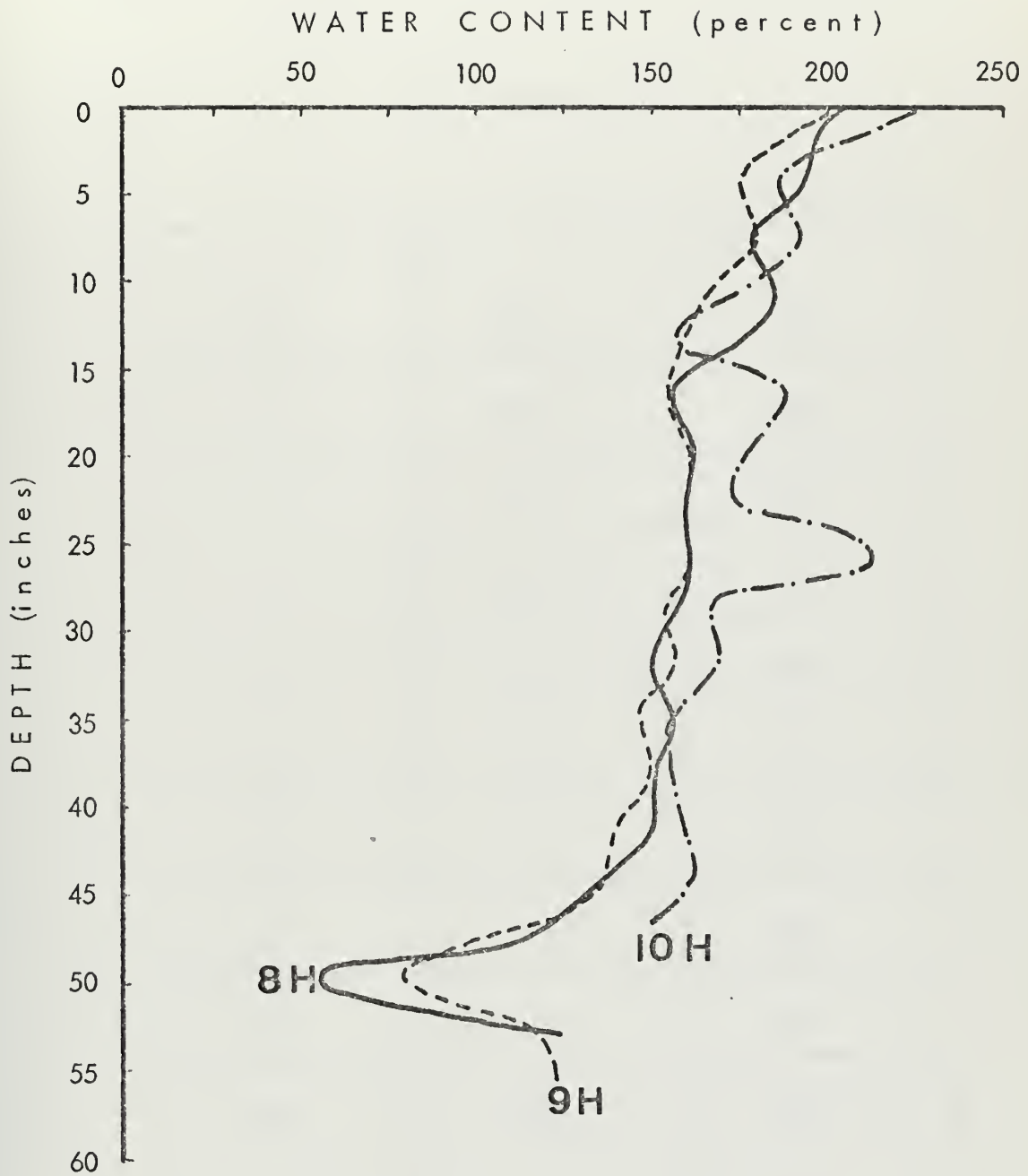


Figure 43: The variation of original water content with depth for Guide Seamount cores 8 H through 10 H

TABLE 5: The minimum and maximum values of original water content determined for Guide Seamount cores

WATER CONTENT (percent)

CORE	MIN	MAX
1H	130	251
2H	143	230
3H	156	215
4H	97.7	205
5H	139	220
6H	76	213
7H	78	208
8H	55.6	197
9H	78.6	190
10H	150	212

5. Specific Gravity of Solids

The specific gravity of solids was obtained by using the relationship derived by Henderson (1970), the derivation of which is included in Appendix A. This relates the specific gravity of solids to bulk wet density and water content, and according to Henderson (1970), this technique provides values that compare favorably with those obtained by other methods. Tables 6 and 7 are comparison values of the specific gravity of solids for all the cores tested, and a large variation with depth as well as between cores is quite evident. The specific gravity of the materials are noted as ranging from 1.70 to 3.26, as shown in Table 8. The 1.70 value was from the 0-3 inch interval of core 7H where the lowest bulk wet density reading was obtained and is probably not valid, due to improper sampling. High specific gravity values are usually an indication of high carbonate content; however, this was not measured to verify these readings. In comparing Table 7 with the core summaries of Appendix C for cores 6H, 7H, 8H, and 9H, there appears to be no relationship between the higher specific gravity values and the granular regions in these cores.

6. Void Ratio

The void ratio is a measure of the denseness of a sediment and is therefore one of its most important characteristics. In that the void ratio is proportional to water content, as noted by Lambe (1951), void ratio-depth plots tend to image the water content results, as is shown within Appendix C. Most of the void ratio values, as depicted on Figs. 44, 45 and 46, fall within the colloidal clay range as described by Hough (1957). The lowest void ratio value of 1.62 was found in the coarser layer of the 48-51 inch interval of core 8H, as

TABLE 6: The calculated specific gravity values for Guide Seamount cores 1 H through 5 H

SPECIFIC GRAVITY OF SOLIDS

INTERVAL	CORE 1H	CORE 2H	CORE 3H	CORE 4H	CORE 5H
0-3	2.92	2.63	2.69	2.59	2.54
3-6	2.76	2.63	3.11	2.55	2.70
6-9	3.13	2.95	2.67	3.08	2.70
9-12	2.78	2.44	3.08	2.64	2.40
12-15	2.34	2.91	2.60	2.82	3.22
15-18	2.92	2.54	2.48	2.23	2.35
18-21	2.66	2.46	2.88	2.70	2.58
21-24	2.46	2.97	2.75	2.56	2.72
24-27	2.45	2.63	2.74	3.02	2.84
27-30	2.75	2.53	2.71	2.76	2.71
30-33	2.62	2.54	2.80	2.54	2.86
33-36	2.48	2.91	3.22	3.11	2.53
36-39	2.84	2.71	2.43	2.65	2.87
39-42	2.88	2.74	2.77	No Data	2.88
42-45	2.84			2.59	2.99
45-48	2.73			2.88	
48-51				2.58	
51-54				2.49	

TABLE 7: The calculated specific gravity values for Guide Seamount cores 6 H through 10 H

SPECIFIC GRAVITY OF SOLIDS

INTERVAL	CORE 6H	CORE 7H	CORE 8H	CORE 9H	CORE 10H
0-3	2.61	1.70	2.39	2.40	2.15
3-6	2.83	2.36	2.86	2.57	2.46
6-9	2.62	2.50	2.89	2.67	2.78
9-12	2.66	2.25	3.26	2.99	2.68
12-15	2.93	2.48	2.92	2.94	2.79
15-18	2.69	2.36	2.67	2.45	2.78
18-21	3.20	2.45	3.02	2.66	2.75
21-24	2.66	2.69	2.85	2.73	2.93
24-27	2.69	2.43	2.46	2.80	3.13
27-30	2.86	2.79	3.14	2.76	2.95
30-33	2.55	2.72	2.81	2.54	2.66
33-36	2.59	2.67	2.86	2.78	2.86
36-39	2.49	2.58	2.64	2.61	2.57
39-42	2.55	2.78	2.95	2.76	2.86
42-45	2.66	2.90	2.60	2.61	2.75
45-58	2.82	2.77	2.81	2.41	2.65
48-51	2.74	2.49	2.91	2.29	
51-54	2.35		2.62	2.68	
54-57	2.39			2.53	
57-60	2.92				

TABLE 8: The minimum and maximum specific gravity values calculated for Guide Seamount cores

SPECIFIC GRAVITY OF SOLIDS

CORE	MIN	MAX
1H	2.34	3.13
2H	2.44	2.97
3H	2.43	3.22
4H	2.23	3.11
5H	2.35	3.22
6H	2.35	3.20
7H	1.70	2.90
8H	2.39	3.26
9H	2.29	2.99
10H	2.15	3.13

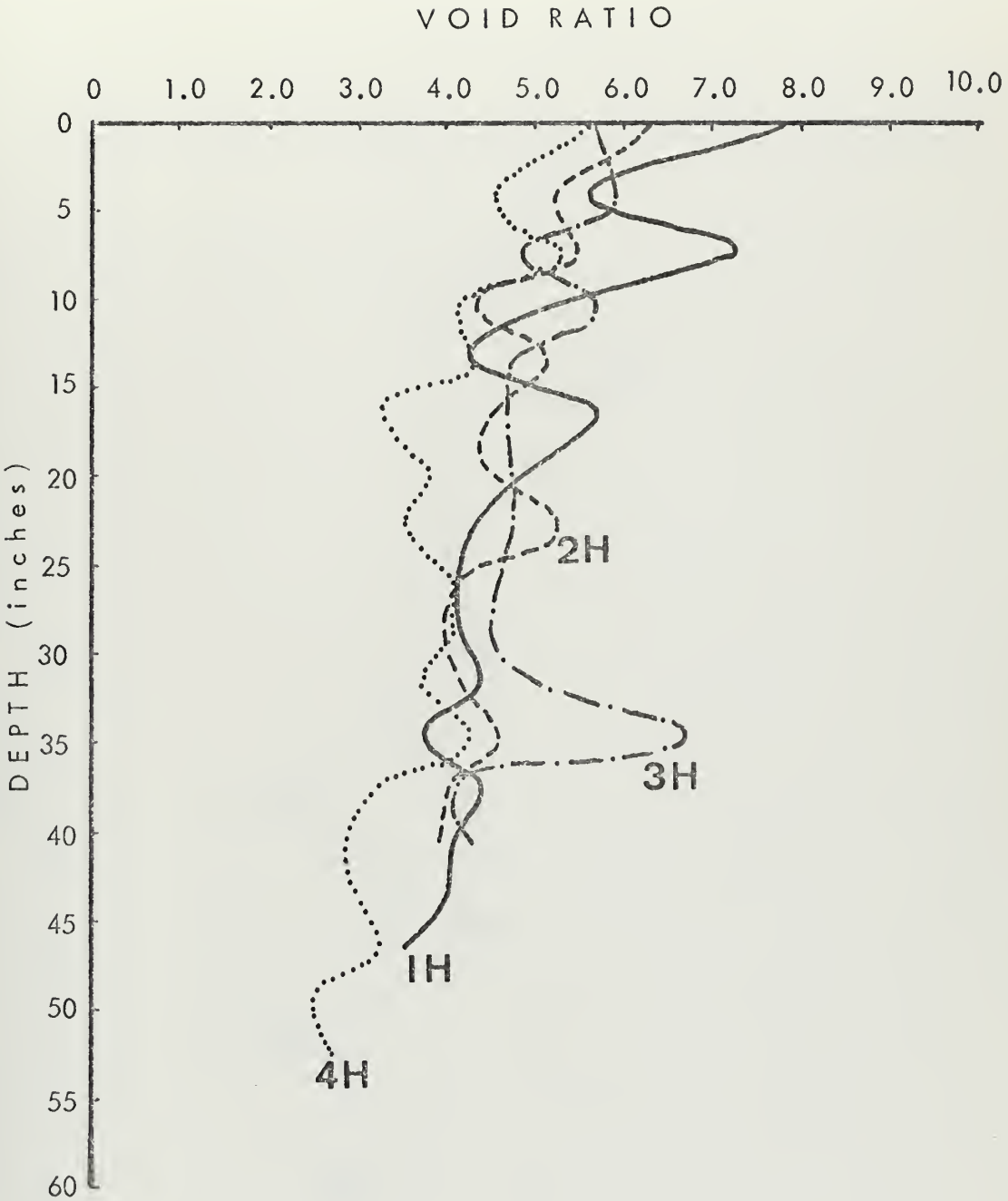


Figure 44: The variation of void ratio with depth for Guide Seamount cores 1 H through 4 H

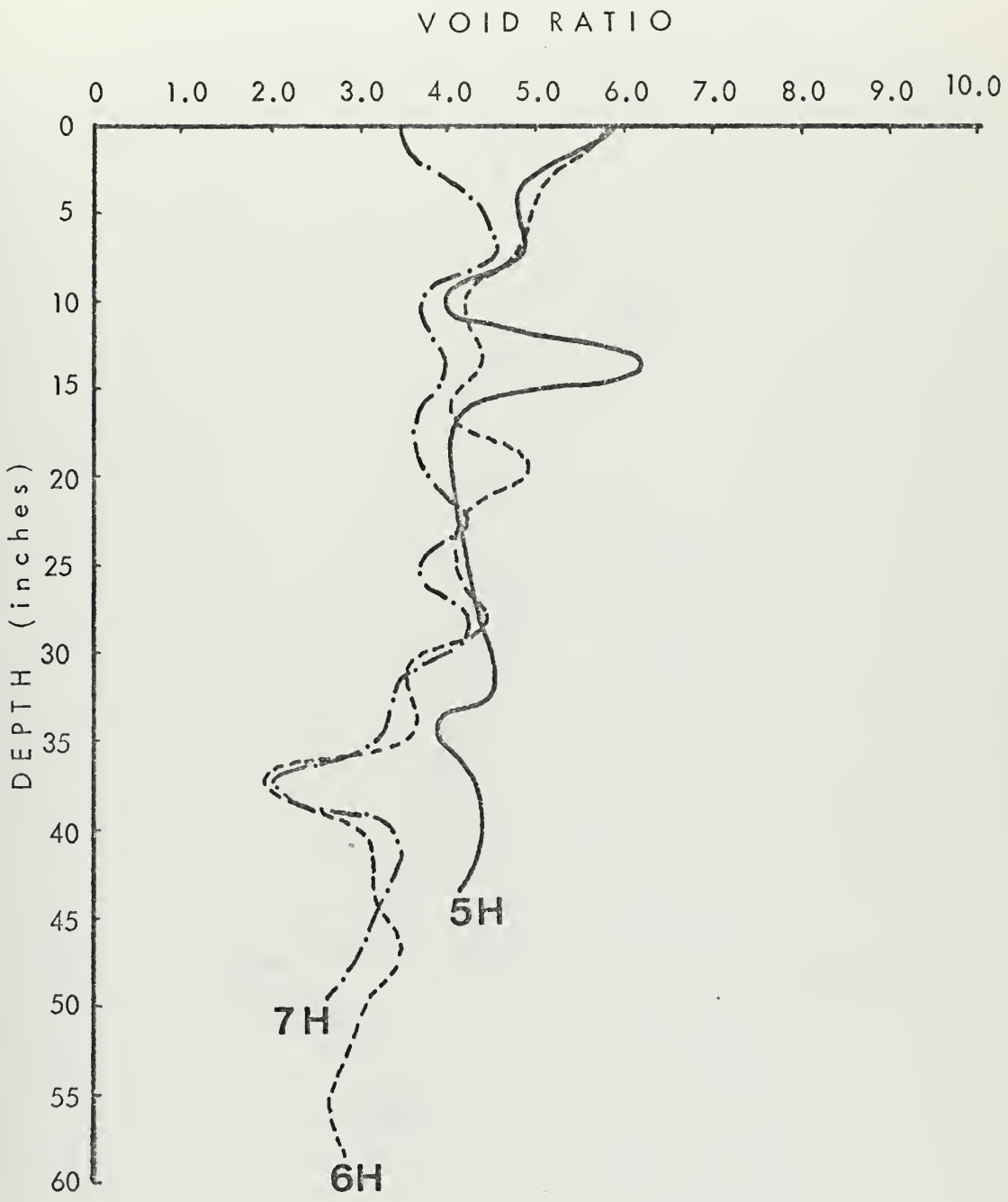


Figure 45: The variation of void ratio with depth for Guide Seamount cores 5 H through 7 H

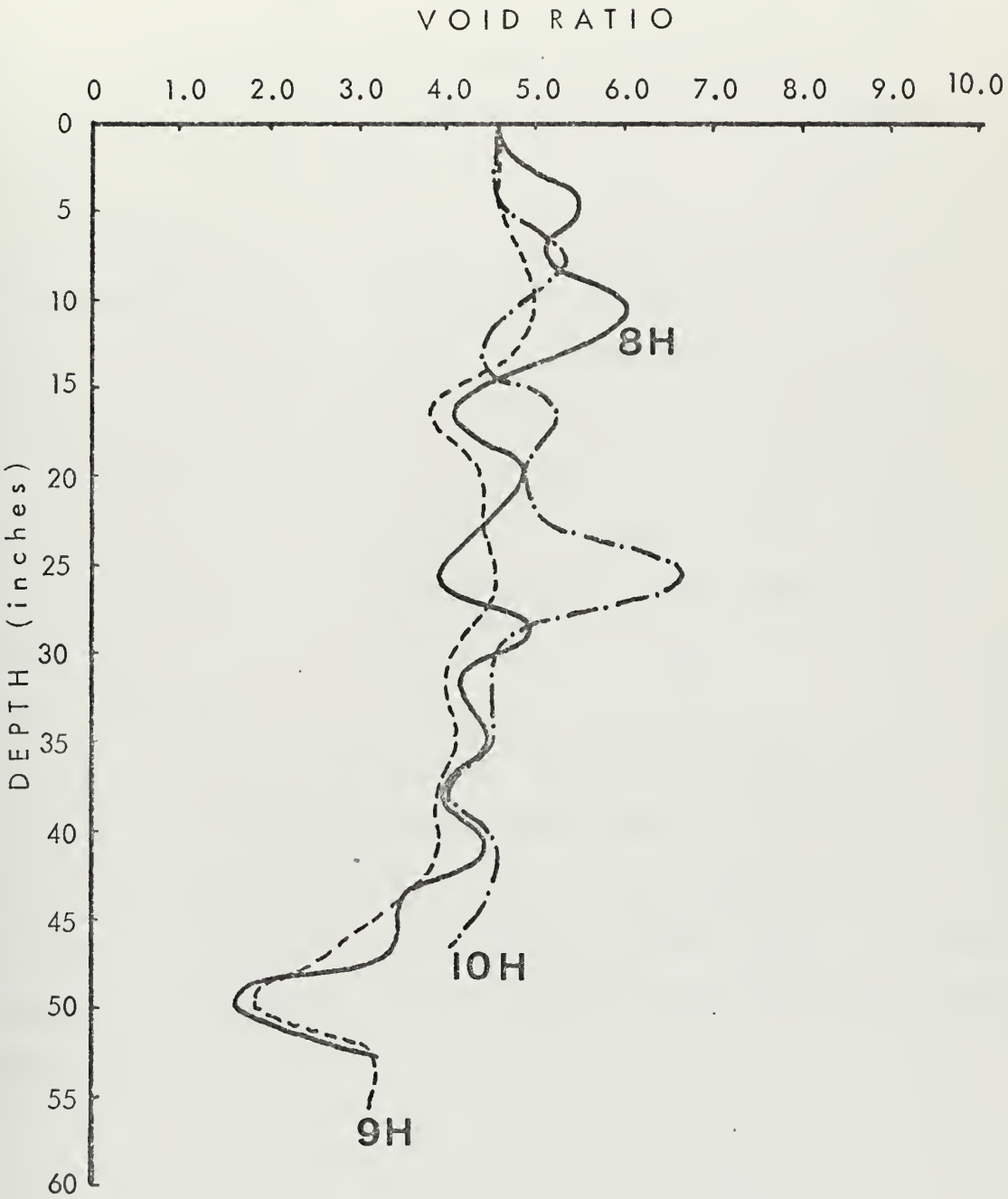


Figure 46: The variation of void ratio with depth for Guide Seamount cores 8 H through 10 H

shown in Table 9, and the highest value of 7.32 was from the two areas of high water content in core 1H. As the void ratio increases the shear strength decreases, or, assuming a 100 percent saturation, as the amount of water in the sediment increases the shear strength decreases.

7. Porosity

The porosity is also a measure of the denseness of a sediment and is thus similar to the void ratio. The porosity can generally be expected to decrease with depth due to normal consolidation of the underlying material by its overburden pressure. Such a result was found in all of the cores tested. The porosity values are given in the core summary sheets of Appendix D, and their range is shown by Table 10.

8. Dry Density

The dry density, or more commonly, the unit dry weight, is a calculated quantity and was found to range from 0.35 to 1.11 grams per cubic centimeter, as shown in Table 11. The values fall within the range of colloidal clays, as described by Hough (1957). A complete listing of the dry density values is included in the core summary sheets of Appendix D.

TABLE 9: The minimum and maximum void ratio values calculated for Guide Seamount cores

VOID RATIO

CORE	MIN	MAX
1H	3.55	7.32
2H	3.93	6.04
3H	4.07	6.75
4H	2.52	5.29
5H	3.88	6.19
6H	1.89	5.55
7H	2.01	4.57
8H	1.62	6.01
9H	1.80	4.97
10H	3.97	6.66

TABLE 10: The minimum and maximum porosity values calculated for Guide Seamount cores

POROSITY (percent)

CORE	MIN	MAX
1H	78.0	88.0
2H	79.7	85.8
3H	80.3	87.1
4H	71.6	84.1
5H	79.5	86.1
6H	65.4	84.7
7H	66.8	82.0
8H	61.9	85.7
9H	64.3	83.2
10H	79.9	86.9

TABLE 11: The minimum and maximum dry density values calculated for Guide Seamount cores

DRY DENSITY (gm/cc)

CORE	MIN	MAX
1H	0.350	0.600
2H	0.373	0.557
3H	0.397	0.519
4H	0.411	0.733
5H	0.386	0.580
6H	0.398	0.860
7H	0.375	0.856
8H	0.418	1.110
9H	0.431	0.818
10H	0.386	0.534

V. AT-SEA EVALUATION

A. GENERAL

In that the present state-of-the-art precludes the obtaining of reliable shear strength measurements in-situ on the sea floor, the next best alternative would appear to be to evaluate the shear strength of deep sea cores at-sea as soon as they are brought on board ship. In the past, most cores were stored aboard ship until they could be transported to a shore-based laboratory for testing. While on board ship, the cores are subjected to ship motion and machinery vibrations, causing disturbance of the sample. Also, any further transportation of the cores will result in sample disturbance.

In some instances, it has proven necessary to know what the bottom characteristics are at a given site immediately. As a consequence, a reliable method of measuring the sediment shear strength aboard ship would be most valuable. The vane shear method of shear testing lends itself readily to at-sea measurements.

The NPS Vane Shear Apparatus was therefore tested for at-sea use on board the USNS DE STEIGUER (T-AGOR-12) during NPS Cruise 1201 71 of 13-16 August 1970. The device was tested on the 15th of August on a gravity core taken at 36°-33' North Latitude and 122°-30 West Longitude with a Ewing corer, using 500 pounds of weight. The water depth at the coring site was 2760 fathoms and the core consisted of a grayish-green clayey mud similar in consistency to the Guide Seamount cores.

B. TEST PROCEDURE

After removal from the core barrel, the liner was sectionalized into three inch increments and every other section was capped and taped

for transportation back to Monterey. Testing was done in the sediment laboratory at the Naval Postgraduate School.

For the at-sea tests, the NPS Vane Shear apparatus was set up on the port side of the main laboratory of the DE STEIGUER. The top three inches was then tested, using the apparatus mounted on the table stand. The ship's motion indicated that the wall mounted core holding bracket method would perform better since the device and the sample would function more as a unit. The remainder of the tests made on board ship were conducted in this latter configuration and utilized various vane sizes. It was found that the size of the vane appeared to have little or no effect on the results of the test other than requiring the use of different scale settings on the recorder. The tests at the laboratory were conducted in the same configuration as the at-sea tests. Various vane sizes were alternated so as to be consistent with the at-sea tests.

High frequency machinery vibrations produced no apparent effect on the operation of the vane shear apparatus. As evidenced by Fig. 47, the motion of the ship did appear as a superposition upon the torque curve as plotted by the recorder. However, in each case of the at-sea tests, the characteristic shape of the output curve was maintained. A line through the average output values results in a curve of torque to well within the accuracy of the test.

The variation in the signal output caused by the ship's motion is produced by a pendulum action of the device coupled with the motion of the sample within its container. Accelerations caused by the ship's motion tend to move the sample within the core liner because of the extremely soft nature of the sediment. This tends to put a lateral force

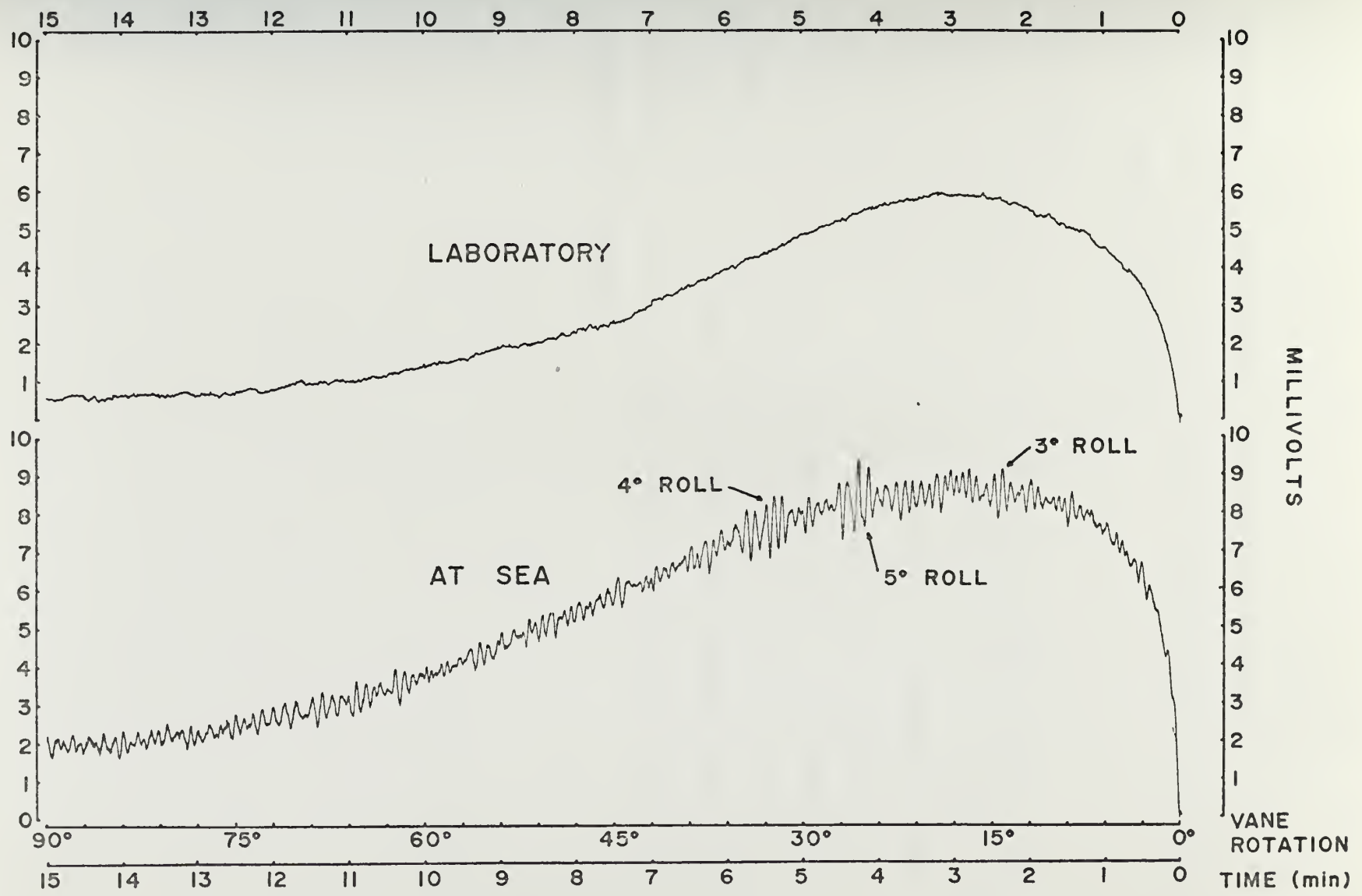


Figure 47: Typical continuous vane shear records produced by the NPS Vane Shear Apparatus in laboratory and at-sea tests

on the vane, which in turn causes the transducer to send a signal in addition to the normal output signal from the vane rotation. The magnitude of the fluctuations superimposed on the output signal can be reduced by using a larger vane size which requires a less sensitive scale setting on the recorder.

C. RESULTS

As demonstrated by Fig. 48, the values of shear strength in the tests conducted at-sea and in the laboratory compared favorably. That shear strength varies considerably with depth is evidenced by the Guide Seamount cores. Figure 49 is a curve made by combining the data points from the at-sea and laboratory tests. The amount of variability with depth is approximately the same as for the Guide Seamount cores and tends to corroborate that the at-sea curve gives as accurate results of the shear strength as the cores tested under laboratory conditions.

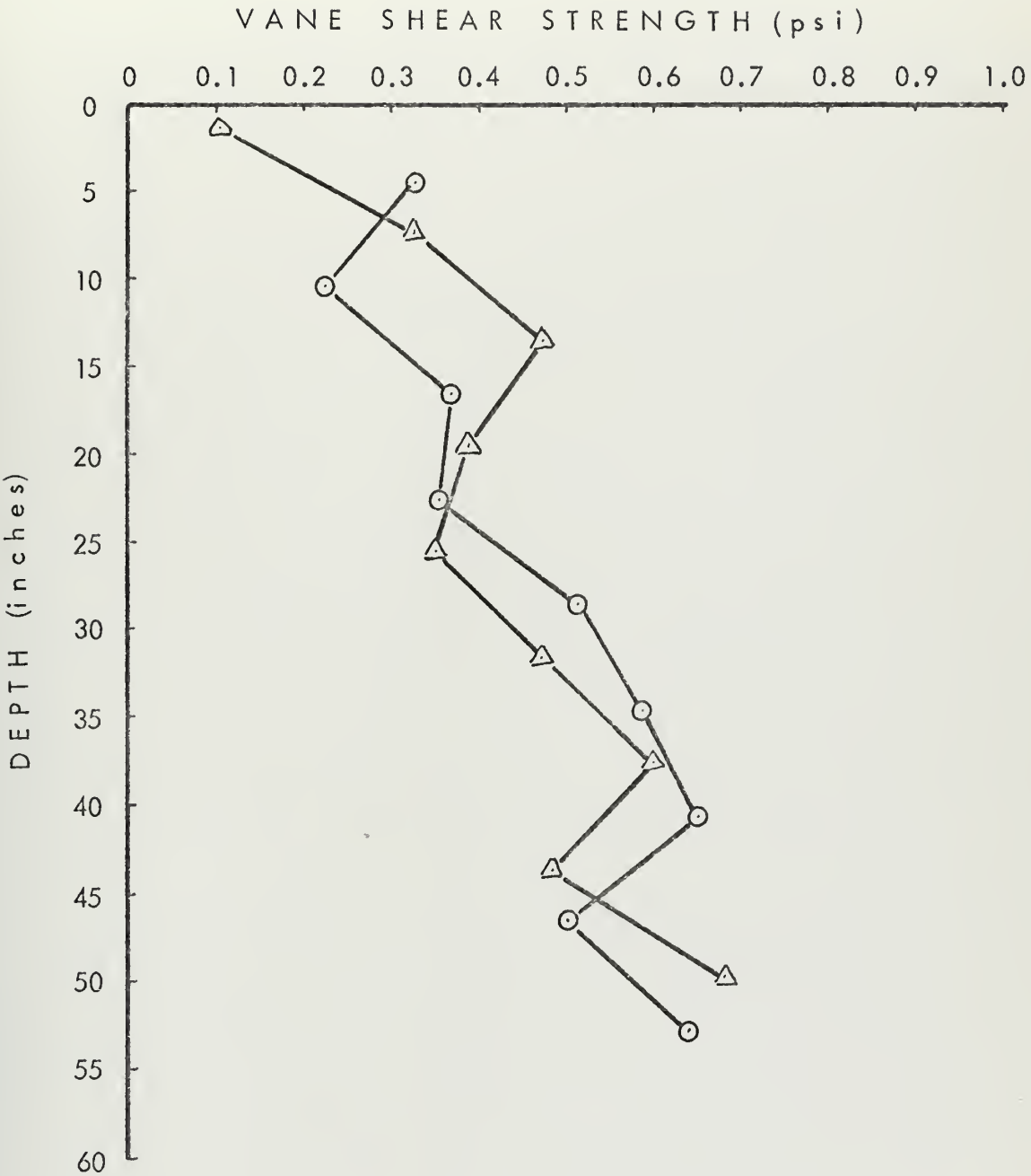


Figure 48: The variation of vane shear strength with depth comparing the results of laboratory and at-sea tests

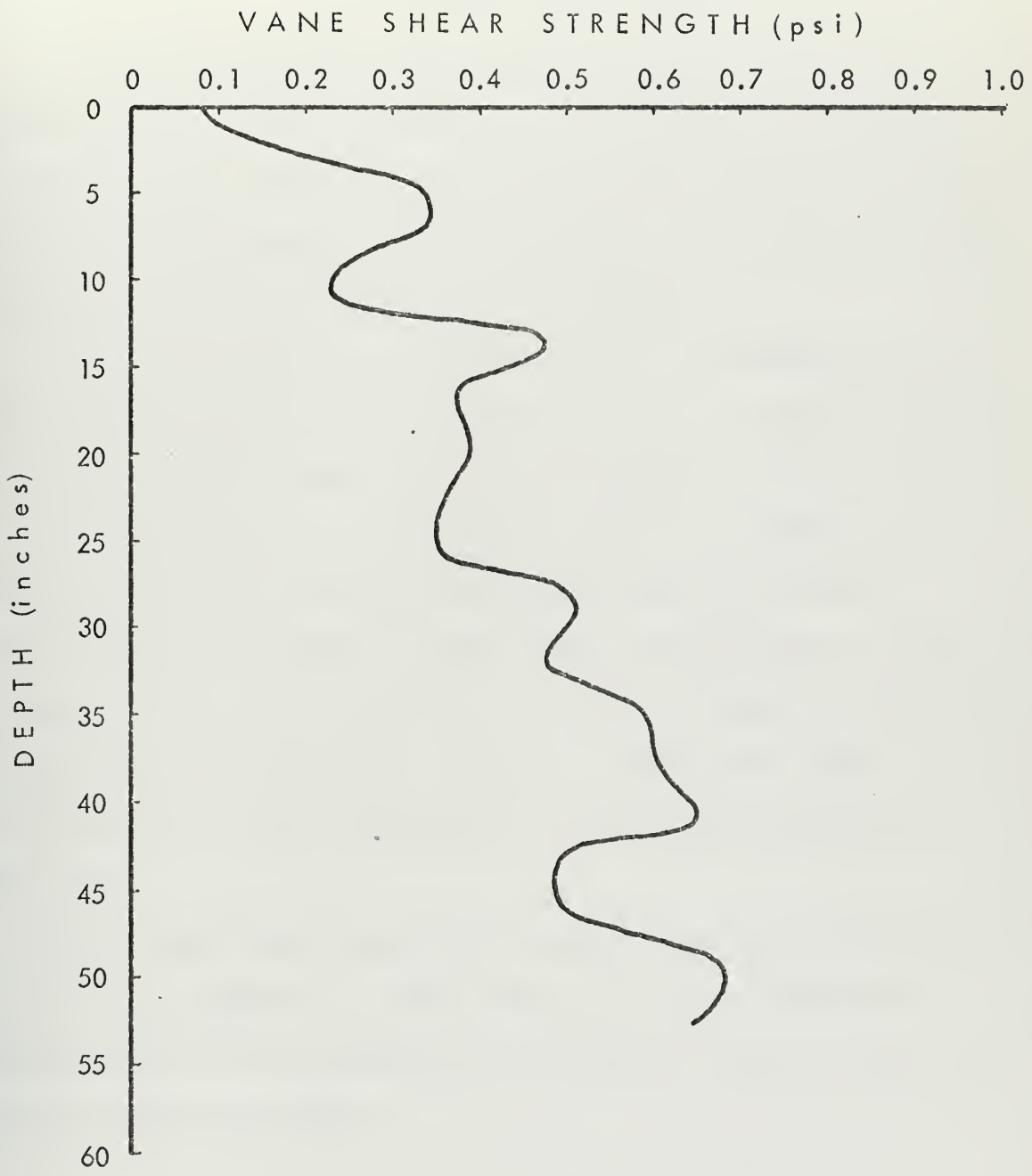


Figure 49: The variation of vane shear strength with depth of the combined laboratory and at-sea tests

VI. SUMMARY AND CONCLUSIONS

Ten deep ocean gravity cores were collected from the Guide Seamount region located approximately 70 miles west of the Central California coast. These were transported to the sediment laboratory at the Naval Postgraduate School in Monterey, where their engineering properties were examined at three inch intervals.

The shear strength of the sediment cores was determined with the NPS Vane Shear Apparatus and was found to vary in a range from 0.082 to 0.990 pounds per square inch. Pelagic sediment areas were found in the cores taken from the southeastern side of the seamount and these exhibited high bulk wet densities and low water contents. Shear strength measurements in these areas were consistent with the findings for the rest of the core. The shear strength was generally found to increase with depth; however, a decrease was noted in most cores around the 24-27 inch interval followed by an increase below this area.

The NPS Vane Shear Apparatus was tested at-sea and the measured results were compared to on-shore laboratory tests. The results demonstrated that the apparatus was as effective at-sea as when used in the laboratory on-shore.

VII. RECOMMENDATIONS FOR FURTHER RESEARCH

The following studies are considered worthy of future investigation within the general area of vane shear testing of marine sediments:

a. Determine the effects of variation in the rate of rotation of the vanes.

b. Compare test results using various sized vanes and a variation in the number of blades in a material of reproducible strength to determine the effects of these variables.

c. Determine the optimum size of a vane to be used within a core liner with minimum effect on the shear strength by the liner.

d. Determine to what degree the shear strength of a sediment is affected by ship motion when performing tests at-sea.

e. Contrast shear strengths obtained from fresh cores at sea with cores from the same area that have been stored for a considerable period of time.

APPENDIX A

DERIVATIONS OF FORMULAS

Relationship of Shear Strength to Vane Shear Torque

s = shearing resistance of the sediment, pounds per square inch

T = total torque at failure, inch-pounds

T_1 = torque resistance on the vertical cylindrical surface, inch-pounds

T_2 = torque resistance on the horizontal top and bottom, assuming constant unit shear resistance, inch-pounds

r = radius of cylindrical plug sheared by vane, inches

h = height of vane, inches

Torque = Force X distance

$$T = T_1 + 2T_2$$

$$T = (2\pi rh)rs + 2\left(2\pi s \int_0^r x^2\,dx\right)$$

$$T = 2\pi r^2 hs + \frac{4}{3}\pi r^3 s$$

$$T = s\left(2\pi r^2 h + \frac{4}{3}\pi r^3\right)$$

$$s = \frac{T}{\left(2\pi r^2 h + \frac{4}{3}\pi r^3\right)}$$

Derivation of an Equation Relating Specific Gravity, Bulk Wet Density, and Water Content

Water content is defined as the weight of water in a sample divided by the weight of solids in the sample, i.e.,

$$WC = \frac{W_w}{W_s} \qquad (1)$$

In that the weight of a material is equal to the volume of the material times its density, equation (1) becomes;

$$WC = \frac{V_w \times D_w}{V_s \times D_s} \tag{2}$$

If the numerator and denominator of (2) are divided by the density of water at four degrees centigrade, equation (2) becomes:

$$WC = \frac{V_w \times \frac{D_w}{D_4}}{V_s \times \frac{D_s}{D_4}} \tag{3}$$

The ratio D_w/D_4 is the specific gravity of water and can be assumed equal to one for this derivation. D_s/D_4 is the specific gravity of solids. Equation (3) then becomes:

$$WC = \frac{V_w}{V_s \times G_s} \tag{4}$$

Bulk wet density is defined as the weight of a wet sample divided by its volume:

$$BWD = \frac{W_t}{V_t} \tag{5}$$

Ignoring the dissolved salts, the total weight of water is the weight of solids plus the weight of water, and the total volume is the volume of solids plus the volume of water. Equation (5) becomes:

$$BWD = \frac{W_w + W_s}{V_w + V_s} \tag{6}$$

Again, using the definition that weight equals volume times density, assuming the specific gravity of water is one, and dividing

the numerator and denominator of equation (6) by the density of distilled water at 4°Centigrade, equation (6) becomes:

$$BWD = \frac{V_w + V_s \times G_s}{\frac{V_w + V_s}{D_4}} \tag{7}$$

The density of distilled water at four degrees centigrade is one gram per cubic centimeter, and equation (7) is simplified to:

$$BWD = \frac{V_w + V_s \times G_s}{V_w + V_s} \tag{8}$$

Dividing the numerator and denominator of equation (8) by V_w results in:

$$BWD = \frac{1 + G_s \times \frac{V_s}{V_w}}{1 + \frac{V_s}{V_w}} \tag{9}$$

Equation (4) may be directly substituted into equation (9) to obtain:

$$BWD = \frac{1 + \frac{1}{WC}}{1 + \frac{V_s}{V_w}} \tag{10}$$

Equation (4) may be rearranged in the form:

$$\frac{V_s}{V_w} = \frac{1}{WC \times G_s} \tag{11}$$

and equation (11) may be substituted into equation (10) to form:

$$BWD = \frac{1 + \frac{1}{WC}}{1 + \frac{1}{WC \times G_s}} \tag{12}$$

Equation (12) may be solved for G_s to obtain:

$$G_s = \frac{BWD}{1 + WC - (BWD \times WC)} \qquad (13)$$

Symbols used in this derivation are:

WC = water content, percentage

W_w = weight of water, grams

W_s = weight of solids, grams

D_w = density of water, grams per cubic centimeter

D_s = density of solids, grams per cubic centimeter

D_4 = density of distilled water at four degrees centigrade, grams per cubic centimeter

G_s = specific gravity of solids

V_w = volume of water, cubic centimeters

V_s = volume of solids, cubic centimeters

BWD = bulk wet density, grams per cubic centimeter

W_t = total weight of solids and water, grams

V_t = total volume of solids and water, grams

APPENDIX B

DEFINITIONS

Bulk Wet Density - The weight per unit volume of an undisturbed sample at its original water content.

Dry Density - The weight of soil solids per unit of total volume of soil mass.

Porosity - The ratio of the volume of voids to the total volume of the soil mass, expressed as a percentage.

Remolded Strength - The strength of sediment after it has had its natural structure modified by manipulation.

Sensitivity - The effect of remolding on the consistency of a cohesive sediment, as given by the ratio of the original strength to the remolded strength.

Shear Strength - The maximum resistance of a sediment to shearing stresses.

Shear Stress - The force per unit area acting with the sediment mass.

Specific Gravity of Solids - The ratio of the weight in air of a given volume of distilled water at a temperature of four degrees centigrade. The relationship of specific gravity, bulk wet density and water content is given in Appendix A.

Unit Weight - The weight per unit volume of soil mass. Although it is recognized that density is defined as mass per unit volume, in the field of soil mechanics the term is frequently used in place of unit weight.

Vane Shear Test - A shear test in which thin radial vanes are forced into the sediment and the resistance to rotation is determined.

Void Ratio - The ratio of the volume of void space to the volume of solid particles in a given sediment mass.

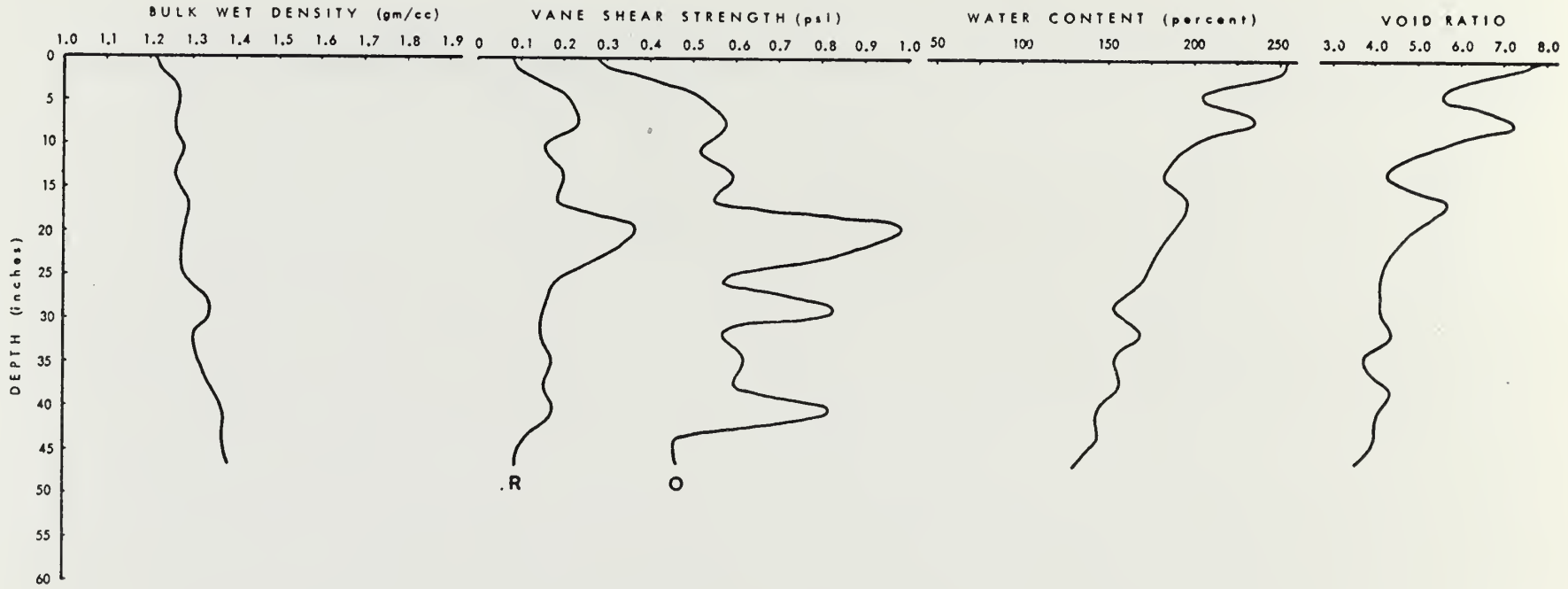
Water Content - The ratio of the weight of water in a given soil mass to the weight of solid particles, expressed as a percentage.

APPENDIX C

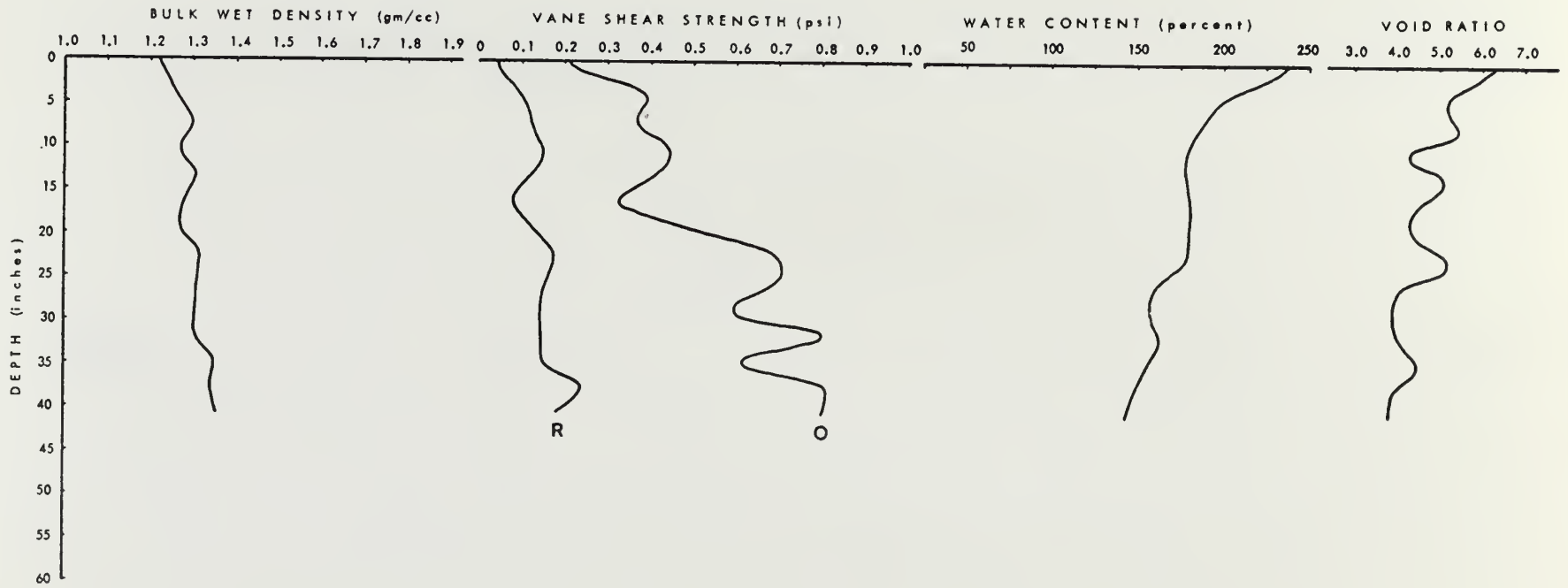
CORE SUMMARY ILLUSTRATIONS

This Appendix contains a summary illustrating the variation of bulk wet density, vane shear strength, original water content and void ratio with depth for the ten deep-sea sediment cores from the Guide Seamount region. The areas designated "sand" represent sand size material which was composed mainly of pelagic sediments and was considerably more gritty than the rest of the core. The symbols "R" and "O" represent remolded and original shear strength, respectively.

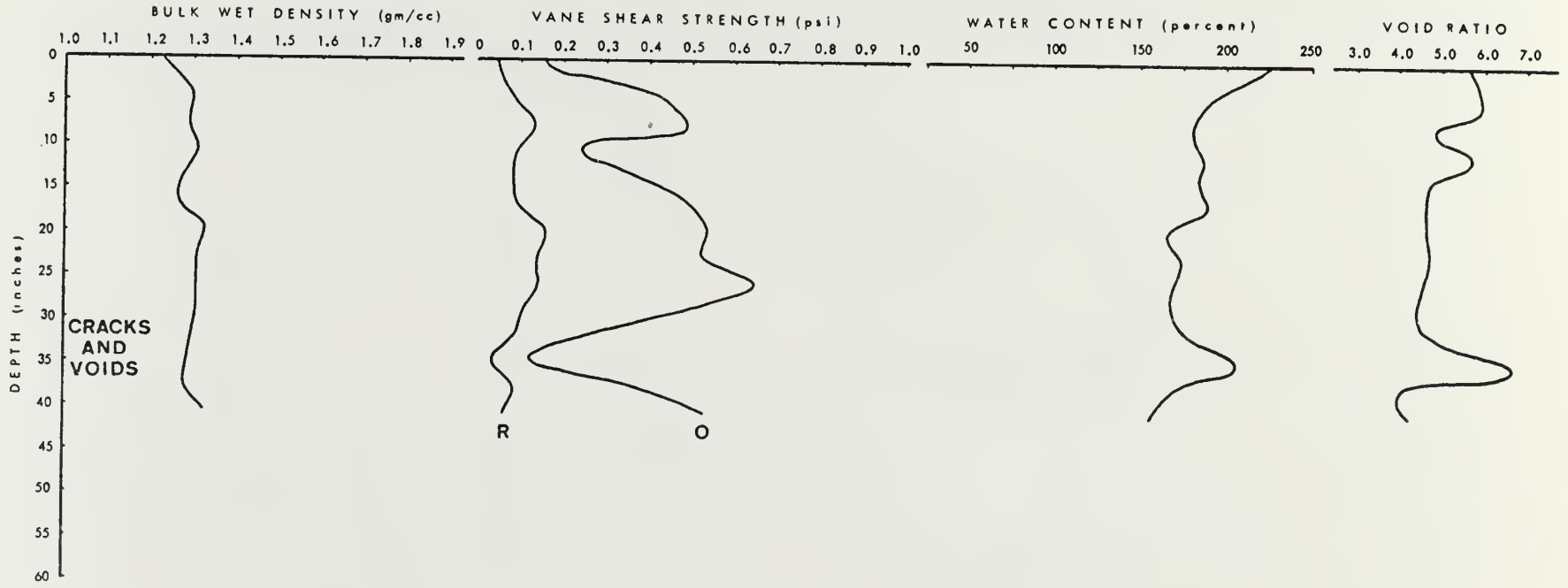
CORE NO: 1H


BULK WET DENSITY (gm/cc)
1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9
VANE SHEAR STRENGTH (psi)
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
R
O
WATER CONTENT (percent)
50 100 150 200 250
VOID RATIO
3.0 4.0 5.0 6.0 7.0 8.0
DEPTH (inches)
0 5 10 15 20 25 30 35 40 45 50 55 60

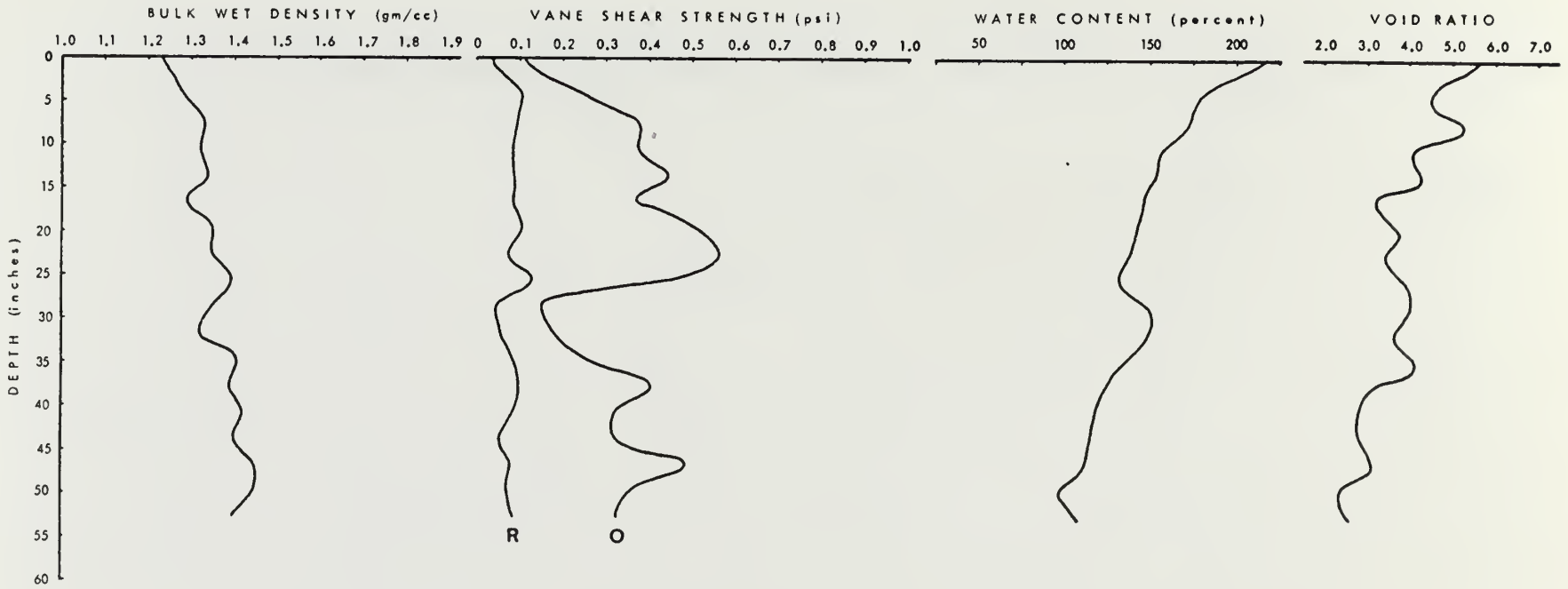
CORE NO: 2 H


BULK WET DENSITY (gm/cc)
1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9
VANE SHEAR STRENGTH (psi)
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
R
O
WATER CONTENT (percent)
50 100 150 200 250
VOID RATIO
3.0 4.0 5.0 6.0 7.0
DEPTH (inches)
0 5 10 15 20 25 30 35 40 45 50 55 60

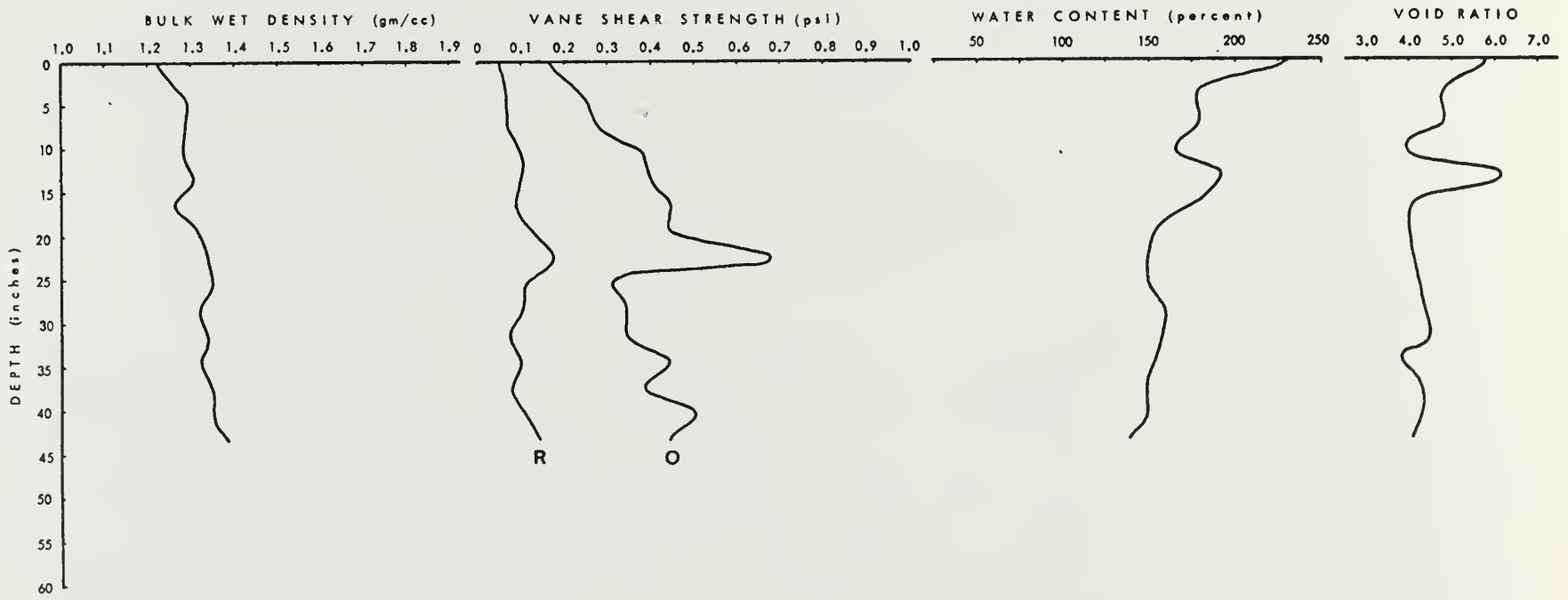
CORE NO: 3 H


BULK WET DENSITY (gm/cc)
1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9
VANE SHEAR STRENGTH (psi)
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
WATER CONTENT (percent)
50 100 150 200 250
VOID RATIO
3.0 4.0 5.0 6.0 7.0
DEPTH (inches)
0 5 10 15 20 25 30 35 40 45 50 55 60
CRACKS AND VOIDS
R
O

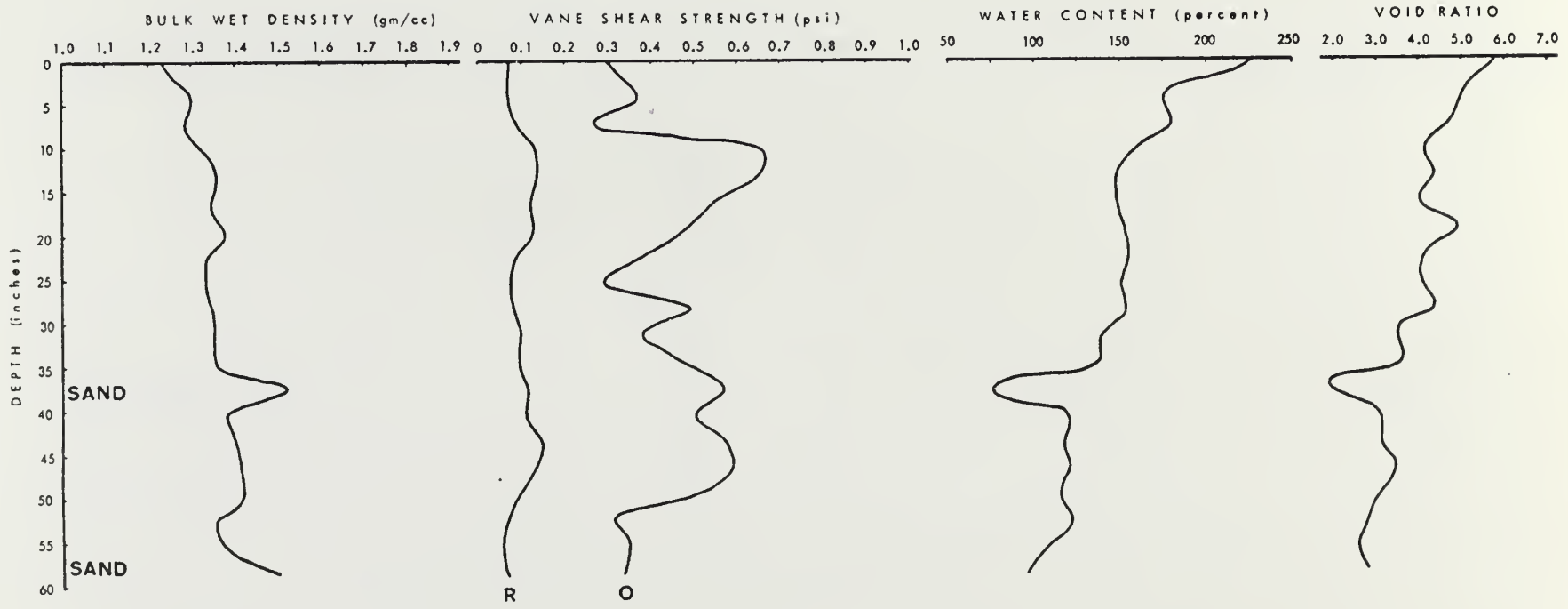
CORE NO: 4 H


BULK WET DENSITY (gm/cc)
1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9
VANE SHEAR STRENGTH (psi)
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
WATER CONTENT (percent)
50 100 150 200
VOID RATIO
2.0 3.0 4.0 5.0 6.0 7.0
DEPTH (inches)
0 5 10 15 20 25 30 35 40 45 50 55 60
R
O

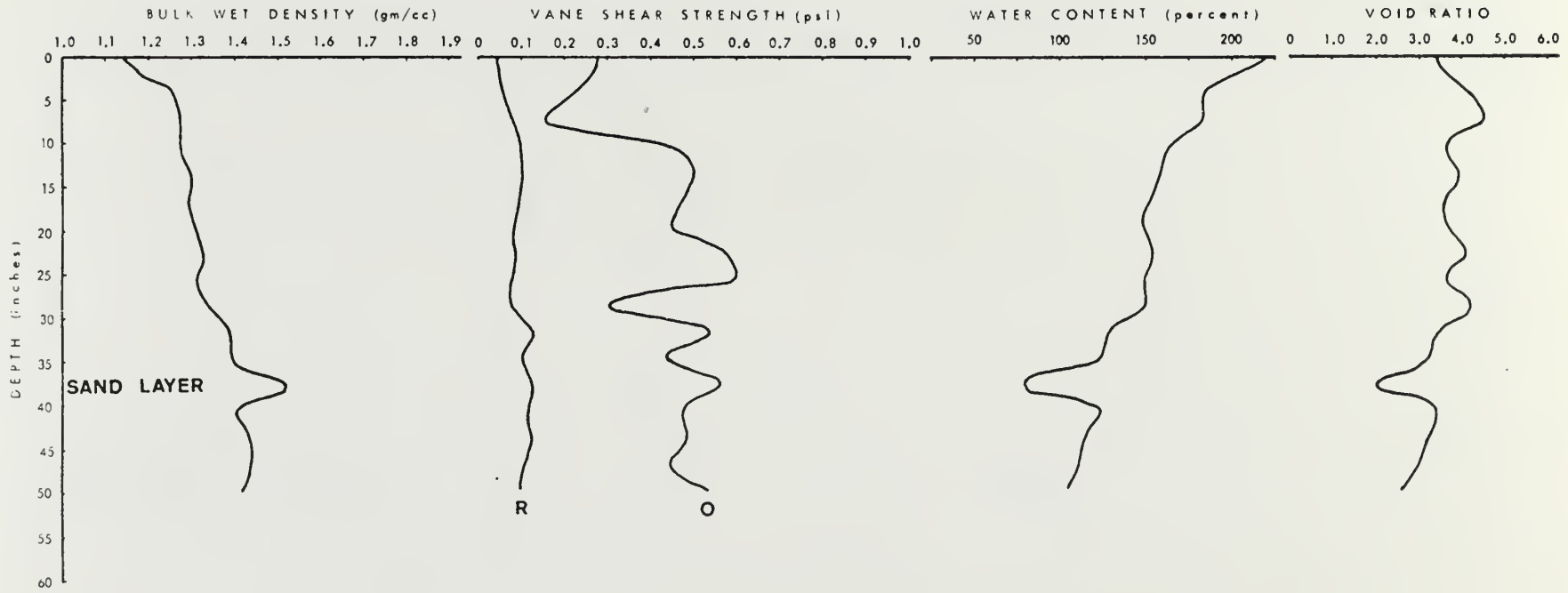
CORE NO: 5 H


BULK WET DENSITY (gm/cc)
1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9
VANE SHEAR STRENGTH (psi)
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
R
O
WATER CONTENT (percent)
50 100 150 200 250
VOID RATIO
3.0 4.0 5.0 6.0 7.0
DEPTH (inches)
0 5 10 15 20 25 30 35 40 45 50 55 60

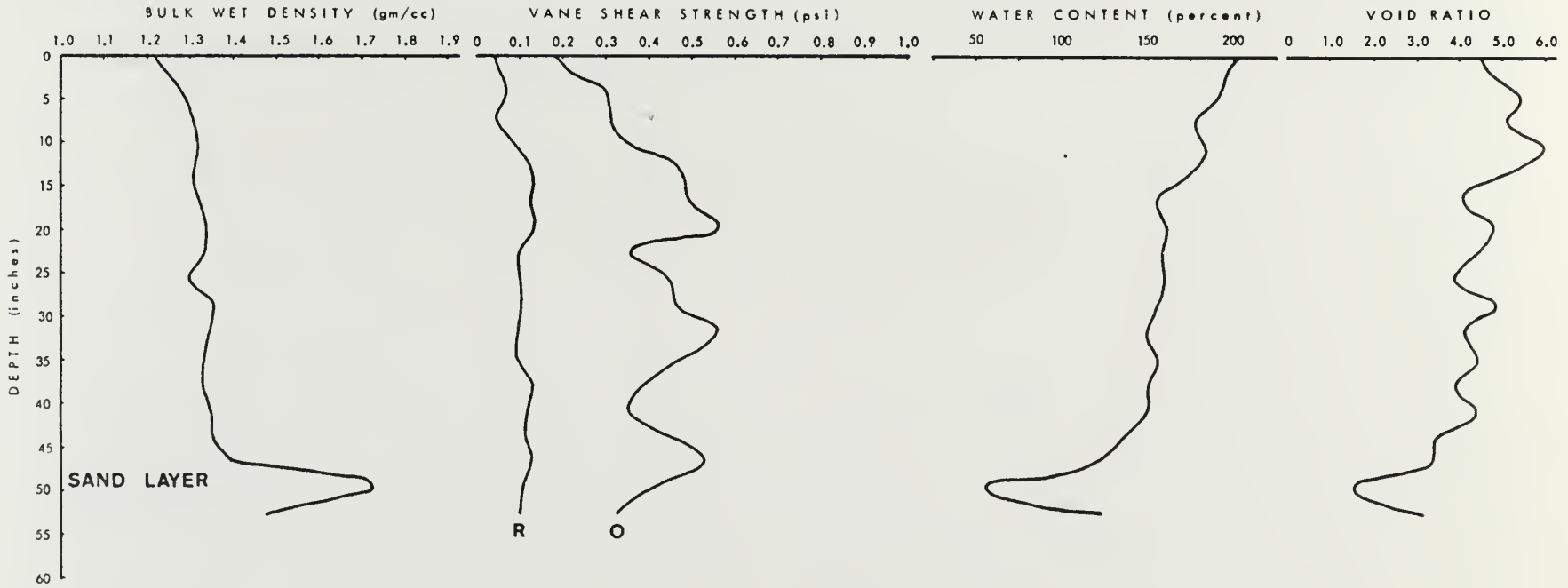
CORE NO: 6 H


BULK WET DENSITY (gm/cc)
1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9
VANE SHEAR STRENGTH (psi)
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
WATER CONTENT (percent)
50 100 150 200 250
VOID RATIO
2.0 3.0 4.0 5.0 6.0 7.0
DEPTH (inches)
0 5 10 15 20 25 30 35 40 45 50 55 60
SAND
SAND
R
O

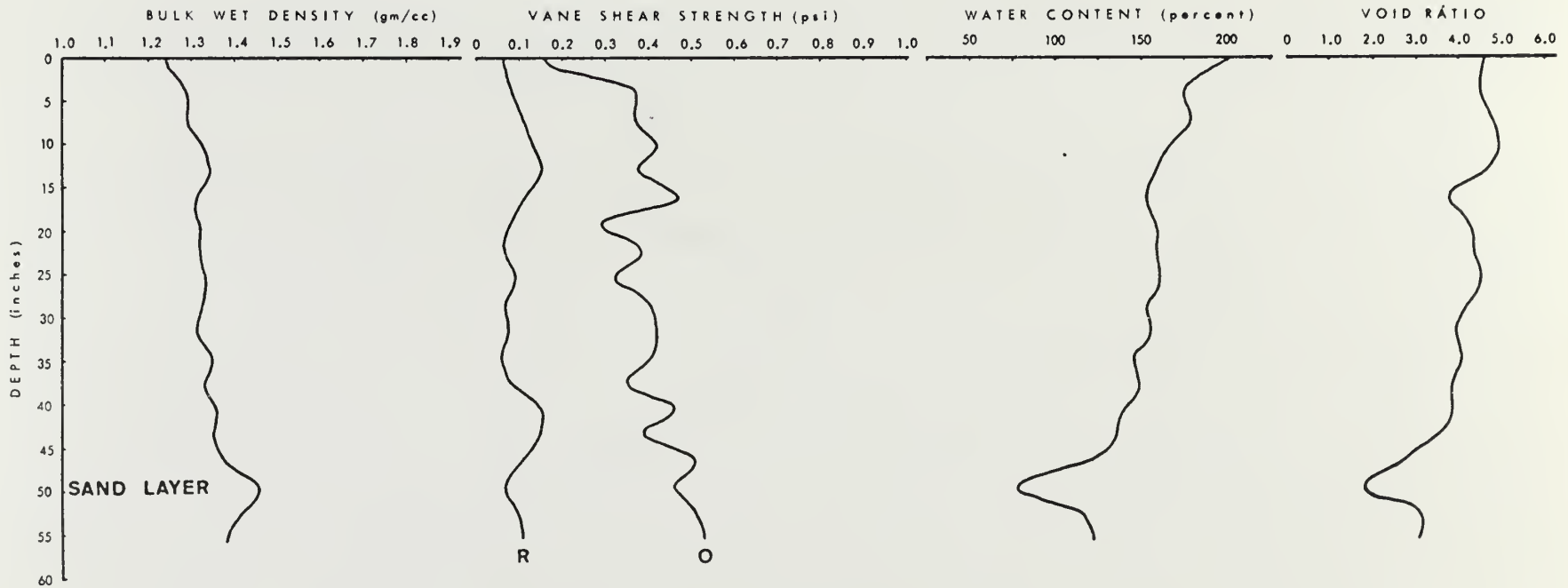
CORE NO: 7 H


BULK WET DENSITY (gm/cc)
1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9
VANE SHEAR STRENGTH (psi)
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
WATER CONTENT (percent)
50 100 150 200
VOID RATIO
0 1.0 2.0 3.0 4.0 5.0 6.0
DEPTH (inches)
0 5 10 15 20 25 30 35 40 45 50 55 60
SAND LAYER
R
O

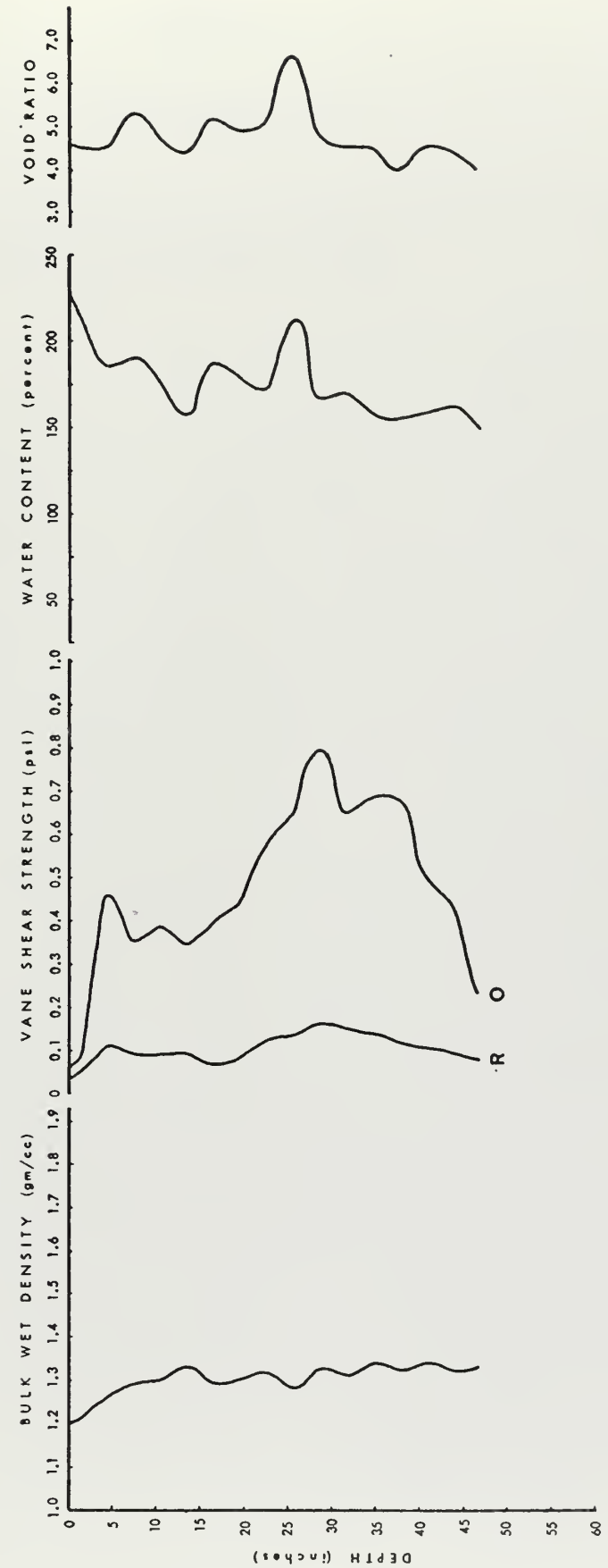
CORE NO: 8 H


BULK WET DENSITY (gm/cc)
1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9
VANE SHEAR STRENGTH (psi)
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
WATER CONTENT (percent)
50 100 150 200
VOID RATIO
0 1.0 2.0 3.0 4.0 5.0 6.0
DEPTH (inches)
0 5 10 15 20 25 30 35 40 45 50 55 60
SAND LAYER
R
O

CORE NO: 9H


BULK WET DENSITY (gm/cc)
1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9
VANE SHEAR STRENGTH (psi)
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
WATER CONTENT (percent)
50 100 150 200
VOID RÁTIO
0 1.0 2.0 3.0 4.0 5.0 6.0
DEPTH (inches)
0 5 10 15 20 25 30 35 40 45 50 55 60
SAND LAYER
R
O

CORE NO: 10 H


BULK WET DENSITY (gm/cc)
1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9
VANE SHEAR STRENGTH (psi)
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
R
O
WATER CONTENT (percent)
50 100 150 200 250
VOID RATIO
3.0 4.0 5.0 6.0 7.0
DEPTH (inches)
0 5 10 15 20 25 30 35 40 45 50 55 60

APPENDIX D

CORE SUMMARY SHEETS

This Appendix contains the core summary sheets for ten deep-sea sediment cores from the Guide Seamount region.

VESSEL: USNS BARTLETT	CRUISE NO: 137006	STATION NO: 13	CORE NO: 1H
COLLECTED BY: Westfahl & Hermann		DATE COLLECTION: 4/24/70	
GENERAL REGION COLLECTION: Guide Seamount		LATITUDE: 37 - 04.2 N	LONGITUDE: 123 - 23.1 W
WATER DEPTH: 1760 fath 3218 meters	HOW OBTAINED: Precision Fath	ACCURACY: No Correction	
CORING TOOL MAKE: Ewing	TYPE: Gravity	LENGTH CORE BARREL: 10 Ft.	WEIGHT: 450 Lbs.
ESTIMATED PENETRATION: 10 Ft.	LENGTH CORE RECOVERED: 48-3/4 In.	GROSS RECOVERY RATIO (%) 40.6	
MIN INSIDE DIA BARREL: 2.34 In.	MIN INSIDE DIA CUTTER: 2.36 In.	INSIDE CLEARANCE RATIO (%) -.85	AREA RATIO(%)
MAX OUTSIDE DIA BARREL: 2.77 In.	MAX OUTSIDE DIA CUTTER 2.38 In.	OUTSIDE CLEARANCE RATIO (%) 21.85	104
GROSS SEDIMENT FACIES: Pelagic	ORIGIN: Terrigenous		
RELATION TO TOPOGRAPHY: Base of Seamount			
STRATIGRAPHIC SIGNIFICANCE: None			

REMARKS - SIGNIFICANCE OF COLOR, TEXTURE, STRUCTURE VARIATIONS: Uniform grayish green color -- smooth greasy texture -- no structural variations

INTERVAL (inches)	COLOR (GSA No.)	ODOR	BULK WET DENSITY (gm/cc)	VANE SHEAR STRENGTH (psi)	REMOLDED STRENGTH (psi)	SENSITIVITY	WATER CONTENT (%)	SPECIFIC GRAVITY SOLIDS	DRY DENSITY (gm/cc)	VOID RATIO	POROSITY (%)
0-3	5GY3/2	H_2S	1.23	0.311	0.096	3.26	251	2.92	0.350	7.32	88.0
3-6	5GY3/2	H_2S	1.27	0.512	0.205	2.50	203	2.76	0.418	5.58	84.8
6-9	5GY3/2	H_2S	1.26	0.581	0.239	2.33	235	3.13	0.375	7.32	88.0
9-12	5GY3/2	H_2S	1.28	0.511	0.157	3.26	192	2.78	0.438	5.34	84.2
12-15	5GY3/2	H_2S	1.26	0.596	0.205	2.91	182	2.34	0.448	4.23	80.9
15-18	5GY3/2	H_2S	1.29	0.546	0.184	2.97	198	2.92	0.431	5.76	85.2
18-21	5GY3/2	H_2S	1.28	0.990	0.375	2.07	187	2.66	0.445	4.99	83.3
21-24	5GY3/2	H_2S	1.27	0.854	0.308	2.77	178	2.46	0.457	4.38	81.4
24-27	5GY3/2	H_2S	1.28	0.567	0.184	3.08	171	2.45	0.472	4.18	80.7
27-30	5GY3/2	H_2S	1.34	0.836	0.160	5.22	152	2.75	0.532	4.16	80.6
30-33	5GY3/2	H_2S	1.30	0.564	0.144	3.93	170	2.62	0.480	4.46	81.7
33-36	5GY3/2	H_2S	1.31	0.625	0.174	3.59	153	2.48	0.518	3.78	79.1
36-39	5GY3/2	H_2S	1.34	0.597	0.154	3.98	157	2.84	0.521	4.46	81.7
39-42	5GY3/2	H_2S	1.37	0.819	0.178	4.61	143	2.88	0.564	4.10	80.4
42-45	5GY3/2	H_2S	1.37	0.457	0.113	4.05	144	2.84	0.559	4.08	80.3
45-48-3/4	5GY3/2	H_2S	1.38	0.464	0.089	5.23	130	2.73	0.600	3.55	78.0

NOTES:

VESSEL: USNS BARTLETT	CRUISE NO: 137006	STATION NO: 13	CORE NO: 2H
COLLECTED BY: Westfahl & Hermann		DATE COLLECTION: 4/24/70	
GENERAL REGION COLLECTION: Guide Seamount		LATITUDE: 37 - 02.7 N	LONGITUDE: 123 - 23.5 W
WATER DEPTH: 1665 Fath 3042 Meters	HOW OBTAINED: Precision Fath	ACCURACY: No Correction	
CORING TOOL MAKE: Ewing	TYPE: Gravity	LENGTH CORE BARREL: 10 Ft.	WEIGHT: 450 Lbs.
ESTIMATED PENETRATION: 11 Ft.	LENGTH CORE RECOVERED: 42 In.	GROSS RECOVERY RATIO (%): 31.8	
MIN INSIDE DIA BARREL: 2.34 In.	MIN INSIDE DIA CUTTER: 2.36 In.	INSIDE CLEARANCE RATIO (%): -.85	AREA RATIO(%): 104
MAX OUTSIDE DIA BARREL: 2.77 In.	MAX OUTSIDE DIA CUTTER: 2.38 In.	OUTSIDE CLEARANCE RATIO (%): 21.85	
GROSS SEDIMENT FACIES: Pelagic	ORIGIN: Terrigenous		
RELATION TO TOPOGRAPHY: Near base of Seamount			
STRATIGRAPHIC SIGNIFICANCE: None			
REMARKS - SIGNIFICANCE OF COLOR, TEXTURE, STRUCTURE VARIATIONS: Uniform grayish green color -- smooth greasy texture -- no structural variations			

INTERVAL (inches)	COLOR (GSA No.)	ODOR	BULK WET DENSITY (gm/cc)	VANE SHEAR STRENGTH (psi)	REMOLDED STRENGTH (psi)	SENSITIVITY	WATER CONTENT (%)	SPECIFIC GRAVITY SOLIDS	DRY DENSITY (gm/cc)	VOID RATIO	POROSITY (%)
0-3	5GY3/2	H_2S	1.23	0.232	0.055	4.25	230	2.63	0.373	6.04	85.8
3-6	5GY3/2	H_2S	1.26	0.393	0.102	3.84	199	2.63	0.423	5.21	83.9
6-9	5GY3/2	H_2S	1.30	0.369	0.123	3.00	186	2.95	0.455	5.49	84.6
9-12	5GY3/2	H_2S	1.27	0.444	0.150	2.96	178	2.44	0.456	4.35	81.3
12-15	5GY3/2	H_2S	1.31	0.409	0.113	3.61	178	2.91	0.470	5.17	83.8
15-18	5GY3/2	H_2S	1.28	0.324	0.079	4.13	180	2.54	0.456	4.56	82.0
18-21	5GY3/2	H_2S	1.27	0.494	0.130	3.81	179	2.46	0.456	4.40	81.5
21-24	5GY3/2	H_2S	1.32	0.696	0.178	3.91	177	2.97	0.475	5.25	84.0
24-27	5GY3/2	H_2S	1.31	0.689	0.161	4.29	161	2.63	0.502	4.24	80.9
27-30	5GY3/2	H_2S	1.31	0.593	0.147	4.04	157	2.53	0.508	3.98	79.9
30-33	5GY3/2	H_2S	1.30	0.801	0.151	5.32	163	2.54	0.494	4.13	80.5
33-36	5GY3/2	H_2S	1.35	0.615	0.150	4.10	156	2.91	0.525	4.54	81.9
36-39	5GY3/2	H_2S	1.34	0.811	0.245	3.32	149	2.71	0.537	4.05	80.2
39-42	5GY3/2	H_2S	1.35	0.802	0.188	4.27	143	2.74	0.557	3.93	79.7

NOTES:

VESSEL: USNS BARTLETT	CRUISE NO: 137006	STATION NO: 13	CORE NO: 3H	
COLLECTED BY: Westfahl & Hermann		DATE COLLECTION: 4/24/70		
GENERAL REGION COLLECTION: Guide Seamount		LATITUDE: 37 - 01.8 N	LONGITUDE: 123 - 23.4 W	
WATER DEPTH: 1570 Fath 2871 Meters	HOW OBTAINED: Precision Fath	ACCURACY: No Correction		
CORING TOOL MAKE: Ewing	TYPE: Gravity	LENGTH CORE BARREL: 10 Ft.	WEIGHT: 450 Lbs.	
ESTIMATED PENETRATION: 10 Ft.	LENGTH CORE RECOVERED: 44 In.	GROSS RECOVERY RATIO (%) 36.6		
MIN INSIDE DIA BARREL: 2.34 In.	MIN INSIDE DIA CUTTER 2.36 In.	INSIDE CLEARANCE RATIO (%) -.85	AREA RATIO(%)	
MAX OUTSIDE DIA BARREL: 2.77 In.	MAX OUTSIDE DIA CUTTER 2.38 In.	OUTSIDE CLEARANCE RATIO (%) 21.85	104	
GROSS SEDIMENT FACIES: Pelagic	ORIGIN: Terrigenous			
RELATION TO TOPOGRAPHY: Slope of Seamount				
STRATIGRAPHIC SIGNIFICANCE: None				

REMARKS - SIGNIFICANCE OF COLOR, TEXTURE, STRUCTURE VARIATIONS: Uniform grayish green color -- smooth greasy texture -- cracks and voids around 33 inch section of core

INTERVAL (inches)	COLOR (GSA No)	ODOR	BULK WET DENSITY (gm/cc)	VANE SHEAR STRENGTH (psi)	REMOLDED STRENGTH (psi)	SENSITIVITY	WATER CONTENT (%)	SPECIFIC GRAVITY SOLIDS	DRY DENSITY (gm/cc)	VOID RATIO	POROSITY (%)
0-3	5GY3/2	H_2S	1.25	0.181	0.055	3.32	215	2.69	0.397	5.76	85.2
3-6	5GY3/2	H_2S	1.30	0.427	0.082	5.21	191	3.11	0.448	5.94	85.6
6-9	5GY3/2	H_2S	1.29	0.489	0.137	3.58	180	2.67	0.460	4.81	82.8
9-12	5GY3/2	H_2S	1.31	0.238	0.099	2.25	186	3.08	0.458	5.71	85.1
12-15	5GY3/2	H_2S	1.28	0.368	0.089	4.16	183	2.60	0.452	4.75	82.6
15-18	5GY3/2	H_2S	1.26	0.495	0.096	5.19	189	2.48	0.436	4.68	82.4
18-21	5GY3/2	H_2S	1.33	0.539	0.161	3.36	164	2.88	0.502	4.74	82.6
21-24	5GY3/2	H_2S	1.31	0.523	0.144	3.64	173	2.75	0.478	4.75	82.6
24-27	5GY3/2	H_2S	1.31	0.649	0.147	4.42	169	2.74	0.489	4.62	82.2
27-30	5GY3/2	H_2S	1.31	0.495	0.113	4.40	167	2.71	0.491	4.52	81.9
30-33	5GY3/2	H_2S	1.30	0.273	0.096	2.85	177	2.80	0.471	4.95	83.2
33-36	5GY3/2	H_2S	1.29	0.123	0.041	3.0	206	3.22	0.422	6.75	87.1
36-39	5GY3/2	H_2S	1.28	0.372	0.089	4.19	167	2.43	0.479	4.07	80.3
39-44	5GY3/2	H_2S	1.33	0.529	0.068	7.78	156	2.77	0.519	4.32	81.2

NOTES:

VESSEL: USNS BARTLETT	CRUISE NO: 137006	STATION NO: 13	CORE NO: 4H
COLLECTED BY: Westfahl & Hermann		DATE COLLECTION: 4/24/67	
GENERAL REGION COLLECTION: Guide Seamount		LATITUDE: 37 - 00.2 N	LONGITUDE: 123 - 24.0 W
WATER DEPTH: 1410 Fath 2578 Meters	HOW OBTAINED: Precision Fath	ACCURACY: No Correction	
CORING TOOL MAKE: Ewing	TYPE: Gravity	LENGTH CORE BARREL: 10 Ft.	WEIGHT: 450 Lbs.
ESTIMATED PENETRATION: 9 Ft.	LENGTH CORE RECOVERED: 54 In.	GROSS RECOVERY RATIO (%) 50	
MIN INSIDE DIA BARREL: 2.34 In.	MIN INSIDE DIA CUTTER: 2.36 In.	INSIDE CLEARANCE RATIO (%) -.85	AREA RATIO(%)
MAX OUTSIDE DIA BARREL: 2.77 In.	MAX OUTSIDE DIA CUTTER: 2.38 In.	OUTSIDE CLEARANCE RATIO (%) 21.85	104
GROSS SEDIMENT FACIES: Pelagic	ORIGIN: Terrigenous		
RELATION TO TOPOGRAPHY: Side of Seamount			
STRATIGRAPHIC SIGNIFICANCE: None			
REMARKS - SIGNIFICANCE OF COLOR, TEXTURE, STRUCTURE VARIATIONS: Uniform grayish green color -- smooth greasy texture - no structural variations			

INTERVAL (inches)	COLOR (GSA No)	ODOR	BULK WET DENSITY (gm/cc)	VANE SHEAR STRENGTH (psi)	REMOLDED STRENGTH (psi)	SENSITIVITY	WATER CONTENT (%)	SPECIFIC GRAVITY SOLIDS	DRY DENSITY (gm/cc)	VOID RATIO	POROSITY (%)
0-3	5GY3/2	H_2S	1.25	0.133	0.048	2.78	205	2.59	0.411	5.29	84.1
3-6	5GY3/2	H_2S	1.28	0.239	0.109	2.19	177	2.55	0.462	4.52	81.9
6-9	5GY3/2	H_2S	1.33	0.372	0.096	3.89	172	3.08	0.489	5.29	84.1
9-12	5GY3/2	H_2S	1.32	0.369	0.089	4.16	157	2.64	0.514	4.13	80.5
12-15	5GY3/2	H_2S	1.34	0.444	0.092	4.82	153	2.82	0.530	4.32	81.2
15-18	5GY3/2	H_2S	1.29	0.369	0.089	4.16	146	2.23	0.524	3.26	76.5
18-21	5GY3/2	H_2S	1.35	0.512	0.109	4.69	143	2.70	0.556	3.86	79.4
21-24	5GY3/2	H_2S	1.35	0.570	0.072	7.95	137	2.56	0.568	3.51	77.8
24-27	5GY3/2	H_2S	1.40	0.443	0.133	3.33	132	3.02	0.605	4.00	80.0
27-30	5GY3/2	H_2S	1.35	0.154	0.048	3.22	149	2.76	0.540	4.10	80.4
30-33	5GY3/2	H_2S	1.32	0.174	0.058	3.00	148	2.54	0.534	3.76	79.0
33-36	5GY3/2	H_2S	1.41	0.239	0.089	2.69	134	3.11	0.602	4.24	80.9
36-39	5GY3/2	H_2S	1.39	0.409	0.103	3.99	123	2.65	0.624	3.25	76.5
39-42	5GY3/2	H_2S	1.42	0.324	0.092	3.51	--	--	--	--	--
42-45	5GY3/2	H_2S	1.48	0.318	0.058	5.49	115	2.59	0.651	2.98	74.9
45-48	5GY3/2	H_2S	1.45	0.492	0.082	6.01	112	2.88	0.683	3.22	76.3
48-51	5GY3/2	H_2S	1.45	0.355	0.079	4.51	97.7	2.58	0.733	2.52	71.6
51-54	5GY3/2	H_2S	1.46	0.331	0.089	3.73	109	2.86	0.671	2.71	73.0

NOTES:

VESSEL: USNS BARTLETT	CRUISE NO: 137006	STATION NO: 13	CORE NO: 5H	
COLLECTED BY: Heck & Carlmark		DATE COLLECTION: 4/24/70		
GENERAL REGION COLLECTION: Guide Seamount		LATITUDE: 36 - 58.8 N	LONGITUDE: 123 - 17.8 W	
WATER DEPTH: 1385 Fath 2535 Meters	HOW OBTAINED: Precision Fath	ACCURACY: No Correction		
CORING TOOL MAKE: Ewing	TYPE: Gravity	LENGTH CORE BARREL: 10 Ft.	WEIGHT: 450 Lbs.	
ESTIMATED PENETRATION: 12 Ft.	LENGTH CORE RECOVERED: 45 In.	GROSS RECOVERY RATIO (%) 31.2		
MIN INSIDE DIA BARREL: 2.34 In.	MIN INSIDE DIA CUTTER 2.36 In.	INSIDE CLEARANCE RATIO (%) -.85	AREA RATIO(%)	
MAX OUTSIDE DIA BARREL: 2.77 In.	MAX OUTSIDE DIA CUTTER: 2.38 In.	OUTSIDE CLEARANCE RATIO (%) 21.8	104	
GROSS SEDIMENT FACIES: Pelagic	ORIGIN: Terrigenous			
RELATION TO TOPOGRAPHY: Small basin near Seamount				
STRATIGRAPHIC SIGNIFICANCE None				

REMARKS - SIGNIFICANCE OF COLOR, TEXTURE, STRUCTURE VARIATIONS: Uniform grayish green color -- smooth greasy texture -- no structural variations

INTERVAL (inches)	COLOR (GSA No)	ODOR	BULK WET DENSITY (gm/cc)	VANE SHEAR STRENGTH (psi)	REMOLDED STRENGTH (psi)	SENSITIVITY	WATER CONTENT (%)	SPECIFIC GRAVITY SOLIDS	DRY DENSITY (gm/cc)	VOID RATIO	POROSITY (%)
0-3	5GY3/2	H_2S	1.24	0.181	0.055	3.31	220	2.54	0.386	5.58	84.8
3-6	5GY3/2	H_2S	1.29	0.246	0.068	3.60	177	2.70	0.466	4.78	82.7
6-9	5GY3/2	H_2S	1.29	0.213	0.068	3.99	179	2.70	0.464	4.82	82.8
9-12	5GY3/2	H_2S	1.28	0.375	0.099	3.79	165	2.40	0.483	3.97	79.9
12-15	5GY3/2	H_2S	1.31	0.393	0.106	3.71	192	3.22	0.448	6.19	86.1
15-18	5GY3/2	H_2S	1.26	0.444	0.089	5.00	178	2.35	0.453	4.18	80.7
18-21	5GY3/2	H_2S	1.32	0.437	0.123	3.55	155	2.58	0.516	4.00	80.0
21-24	5GY3/2	H_2S	1.34	0.684	0.181	3.78	151	2.72	0.533	4.10	80.4
24-27	5GY3/2	H_2S	1.35	0.308	0.116	2.65	150	2.84	0.540	4.26	81.0
27-30	5GY3/2	H_2S	1.32	0.342	0.109	3.13	160	2.71	0.508	4.35	81.3
30-33	5GY3/2	H_2S	1.34	0.341	0.075	4.54	158	2.86	0.518	4.52	81.9
33-36	5GY3/2	H_2S	1.32	0.443	0.106	4.19	154	2.53	0.518	3.88	79.5
36-39	5GY3/2	H_2S	1.35	0.385	0.079	4.91	149	2.87	0.543	4.29	81.1
39-42	5GY3/2	H_2S	1.35	0.505	0.113	4.49	150	2.88	0.540	4.32	81.2
42-45	5GY3/2	H_2S	1.39	0.444	0.147	3.02	139	2.99	0.580	4.15	80.6

NOTES:

VESSEL: USNS BARTLETT	CRUISE NO: 137006	STATION NO: 13	CORE NO: 6H	
COLLECTED BY: Heck & Carlmark		DATE COLLECTION: 4/24/70		
GENERAL REGION COLLECTION: Guide Seamount		LATITUDE: 36 - 58.4 N	LONGITUDE: 123 - 17.2 W	
WATER DEPTH: 1370 Fath 2505 Meters	HOW OBTAINED: Precision Fath	ACCURACY: No Correction		
CORING TOOL MAKE: Ewing	TYPE: Gravity	LENGTH CORE BARREL: 10 Ft.	WEIGHT: 450 Lbs.	
ESTIMATED PENETRATION: 12 Ft.	LENGTH CORE RECOVERED: 60 In.	GROSS RECOVERY RATIO (%) 41.6		
MIN INSIDE DIA BARREL: 2.34 In.	MIN INSIDE DIA CUTTER: 2.36 In.	INSIDE CLEARANCE RATIO (%) -.85	AREA RATIO(%)	
MAX OUTSIDE DIA BARREL: 2.77 In.	MAX OUTSIDE DIA CUTTER: 2.38 In.	OUTSIDE CLEARANCE RATIO (%) 21.85	104	
GROSS SEDIMENT FACIES: Pelagic	ORIGIN: Terrigenous			
RELATION TO TOPOGRAPHY: Flat area near Seamount				
STRATIGRAPHIC SIGNIFICANCE: None				

REMARKS - SIGNIFICANCE OF COLOR, TEXTURE, STRUCTURE VARIATIONS: Uniform grayish green color -- majority of core had smooth greasy texture except for gritty areas around 38 and 58 inch section of core

INTERVAL (inches)	COLOR (GSA No)	ODOR	BULK WET DENSITY (gm/cc)	VANE SHEAR STRENGTH (psi)	REMOLDED STRENGTH (psi)	SENSITIVITY	WATER CONTENT (%)	SPECIFIC GRAVITY SOLIDS	DRY DENSITY (gm/cc)	VOID RATIO	POROSITY (%)
0-3	5GY3/2	H_2S	1.25	0.321	0.072	4.47	213	2.61	0.398	5.55	84.7
3-6	5GY3/2	H_2S	1.30	0.375	0.075	5.00	175	2.83	0.474	4.97	83.3
6-9	5GY3/2	H_2S	1.28	0.270	0.092	2.93	180	2.62	0.459	4.71	82.5
9-12	5GY3/2	H_2S	1.33	0.663	0.144	4.62	155	2.66	0.520	4.13	80.5
12-15	5GY3/2	H_2S	1.30	0.649	0.144	4.52	148	2.93	0.549	4.35	81.3
15-18	5GY3/2	H_2S	1.34	0.549	0.123	4.48	149	2.69	0.538	4.00	80.0
18-21	5GY3/2	H_2S	1.38	0.478	0.130	3.68	153	3.20	0.543	4.90	83.1
21-24	5GY3/2	H_2S	1.33	0.393	0.089	4.43	155	2.66	0.520	4.13	80.5
24-27	5GY3/2	H_2S	1.33	0.290	0.079	3.70	151	2.69	0.531	4.06	80.3
27-30	5GY3/2	H_2S	1.35	0.495	0.085	5.81	153	2.86	0.533	4.37	81.4
30-33	5GY3/2	H_2S	1.35	0.379	0.099	3.84	137	2.55	0.569	3.49	77.7
33-36	5GY3/2	H_2S	1.35	0.472	0.096	4.94	138	2.59	0.565	3.59	78.2
36-39	5GY3/2	H_2S	1.52	0.570	0.113	5.06	76	2.49	0.860	1.89	65.4
39-42	5GY3/2	H_2S	1.38	0.499	0.113	4.43	119	2.55	0.632	3.03	75.2
42-45	5GY3/2	H_2S	1.40	0.573	0.147	3.91	117	2.66	0.647	3.11	75.7
45-48	5GY3/2	H_2S	1.41	0.591	0.137	4.33	121	2.82	0.637	3.43	77.4
48-51	5GY3/2	H_2S	1.42	0.513	0.096	5.37	115	2.74	0.660	3.14	75.9
51-54	5GY3/2	H_2S	1.35	0.314	0.075	4.18	122	2.35	0.608	2.87	74.1
54-57	5GY3/2	H_2S	1.38	0.349	0.058	6.02	109	2.39	0.662	2.61	72.3
57-60	5GY3/2	H_2S	1.50	0.338	0.068	4.96	97	2.92	0.762	2.83	73.9

NOTES:

VESSEL: USNS BARTLETT	CRUISE NO: 137006	STATION NO: 13	CORE NO: 7H
COLLECTED BY: Westfahl & Hermann		DATE COLLECTION: 4/24/70	
GENERAL REGION COLLECTION: Guide Seamount		LATITUDE: 36 - 57.5 N	LONGITUDE: 123 - 16.2 W
WATER DEPTH: 1390 Fath 2542 Meters	HOW OBTAINED: Precision Fath	ACCURACY: No Correction	
CORING TOOL MAKE: Ewing	TYPE: Gravity	LENGTH CORE BARREL: 10 Ft.	WEIGHT: 450 Lbs.
ESTIMATED PENETRATION: 10 Ft.	LENGTH CORE RECOVERED: 52-1/2 In.	GROSS RECOVERY RATIO (%) 43.6	
MIN INSIDE DIA BARREL: 2.34 In.	MIN INSIDE DIA CUTTER 2.36 In.	INSIDE CLEARANCE RATIO (%) -.85	AREA RATIO(%)
MAX OUTSIDE DIA BARREL: 2.77 In.	MAX OUTSIDE DIA CUTTER: 2.38 In.	OUTSIDE CLEARANCE RATIO (%) 21.85	104
GROSS SEDIMENT FACIES: Pelagic	ORIGIN: Terrigenous		
RELATION TO TOPOGRAPHY: Flat area near Seamount			
STRATIGRAPHIC SIGNIFICANCE: None			

REMARKS - SIGNIFICANCE OF COLOR, TEXTURE, STRUCTURE VARIATIONS: Uniform grayish green color -- smooth greasy texture except for gritty area around 38 inch section of core

INTERVAL (inches)	COLOR (GSA No.)	ODOR	BULK WET DENSITY (gm/cc)	VANE SHEAR STRENGTH (psi)	REMOLDED STRENGTH (psi)	SENSITIVITY	WATER CONTENT (%)	SPECIFIC GRAVITY SOLIDS	DRY DENSITY (gm/cc)	VOID RATIO	POROSITY (%)
0-3	5GY3/2	H_2S	1.16	0.270	0.048	5.65	208	1.70	0.375	3.52	77.9
3-6	5GY3/2	H_2S	1.26	0.222	0.060	3.71	183	2.36	0.443	4.32	81.2
6-9	5GY3/2	H_2S	1.27	0.154	0.085	1.81	183	2.50	0.485	4.57	82.0
9-12	5GY3/2	H_2S	1.27	0.461	0.099	4.67	162	2.25	0.485	3.65	78.5
12-15	5GY3/2	H_2S	1.30	0.502	0.106	4.75	158	2.48	0.504	3.93	79.7
15-18	5GY3/2	H_2S	1.29	0.478	0.101	4.75	154	2.36	0.509	3.63	78.4
18-21	5GY3/2	H_2S	1.31	0.444	0.085	5.20	149	2.45	0.528	3.64	78.4
21-24	5GY3/2	H_2S	1.33	0.580	0.089	6.54	155	2.69	0.522	4.16	80.6
24-27	5GY3/2	H_2S	1.31	0.600	0.079	7.64	149	2.43	0.526	3.62	78.4
27-30	5GY3/2	H_2S	1.34	0.304	0.078	3.88	151	2.79	0.534	4.22	80.8
30-33	5GY3/2	H_2S	1.39	0.546	0.127	4.31	128	2.72	0.609	3.47	77.6
33-36	5GY3/2	H_2S	1.39	0.437	0.099	4.42	125	2.67	0.616	3.32	76.9
36-39	5GY3/2	H_2S	1.52	0.567	0.126	4.49	78	2.58	0.856	2.01	66.8
39-42	5GY3/2	H_2S	1.48	0.478	0.115	4.16	124	2.78	0.625	3.44	77.5
42-45	5GY3/2	H_2S	1.43	0.491	0.123	4.00	114	2.90	0.669	3.33	77.0
45-48	5GY3/2	H_2S	1.44	0.443	0.109	4.05	111	2.77	0.681	3.07	75.4
48-52½	5GY3/2	H_2S	1.42	0.539	0.099	5.44	105	2.49	0.691	2.61	72.3

NOTES:

VESSEL: USNS BARTLETT	CRUISE NO: 137006	STATION NO: 13	CORE NO: 8H		
COLLECTED BY: Westfahl & Hermann			DATE COLLECTION: 4/24/70		
GENERAL REGION COLLECTION: Guide Seamount		LATITUDE: 36 -57.0 N	LONGITUDE: 123 - 15.6 W		
WATER DEPTH: 1445 Fath 2642 Meters	HOW OBTAINED: Precision Fath	ACCURACY: No Correction			
CORING TOOL MAKE: Ewing	TYPE: Gravity	LENGTH CORE BARREL: 10 Ft.	WEIGHT: 450 Lbs.		
ESTIMATED PENETRATION: 9 Ft.	LENGTH CORE RECOVERED: 54 In.	GROSS RECOVERY RATIO (%) 50			
MIN INSIDE DIA BARREL: 2.34 In.	MIN INSIDE DIA CUTTER: 2.36 In.	INSIDE CLEARANCE RATIO (%) -.85	AREA RATIO(%)		
MAX OUTSIDE DIA BARREL: 2.77 In.	MAX OUTSIDE DIA CUTTER: 2.38 In.	OUTSIDE CLEARANCE RATIO (%) 21.85	104		
GROSS SEDIMENT FACIES: Pelagic	ORIGIN: Terrigenous				
RELATION TO TOPOGRAPHY: Flat area near Seamount					
STRATIGRAPHIC SIGNIFICANCE: None					
REMARKS - SIGNIFICANCE OF COLOR, TEXTURE, STRUCTURE VARIATIONS: Uniform grayish green color -- smooth greasy texture except for the gritty area around 49 inch section of core					

INTERVAL (inches)	COLOR (GSA No.)	ODOR	BULK WET DENSITY (gm/cc)	VANE SHEAR STRENGTH (psi)	REMOLDED STRENGTH (psi)	SENSITIVITY	WATER CONTENT (%)	SPECIFIC GRAVITY SOLIDS	DRY DENSITY (gm/cc)	VOID RATIO	POROSITY (%)
0-3	5GY3/2	H_2S	1.24	0.201	0.048	4.21	197	2.39	0.418	4.72	82.5
3-6	5GY3/2	H_2S	1.29	0.276	0.068	4.22	192	2.86	0.441	5.47	84.6
6-3	5GY3/2	H_2S	1.31	0.307	0.044	6.91	177	2.89	0.472	5.12	83.7
9-12	5GY3/2	H_2S	1.32	0.358	0.084	4.28	184	3.26	0.465	6.01	85.7
12-15	5GY3/2	H_2S	1.31	0.474	0.130	3.65	174	2.92	0.480	5.09	83.6
15-18	5GY3/2	H_2S	1.32	0.482	0.126	3.81	154	2.67	0.521	4.12	80.4
18-21	5GY3/2	H_2S	1.34	0.560	0.133	4.21	162	3.02	0.513	4.88	83.0
21-24	5GY3/2	H_2S	1.34	0.358	0.096	3.75	158	2.85	0.519	4.49	81.8
24-27	5GY3/2	H_2S	1.30	0.447	0.106	4.22	159	2.46	0.501	3.90	79.6
27-30	5GY3/2	H_2S	1.36	0.461	0.106	4.36	157	3.14	0.528	4.95	83.2
30-33	5GY3/2	H_2S	1.35	0.560	0.099	5.66	148	2.81	0.544	4.18	80.7
33-36	5GY3/2	H_2S	1.34	0.494	0.092	5.35	156	2.86	0.524	4.47	81.7
36-39	5GY3/2	H_2S	1.33	0.396	0.130	3.05	150	2.64	0.532	3.96	79.8
39-42	5GY3/2	H_2S	1.35	0.348	0.120	2.91	151	2.95	0.539	4.46	81.7
42-45	5GY3/2	H_2S	1.35	0.437	0.116	3.77	137	2.60	0.571	3.55	78.0
45-48	5GY3/2	H_2S	1.41	0.530	0.130	4.09	122	2.81	0.633	3.44	77.5
48-51	5GY3/2	H_2S	1.73	0.410	0.113	3.64	55.6	2.91	1.11	1.62	61.9
51-54	5GY3/2	H_2S	1.38	0.324	0.106	3.06	124	2.62	0.617	3.25	76.5

NOTES:

VESSEL: USNS BARTLETT	CRUISE NO: 137006	STATION NO: 13	CORE NO: 9H	
COLLECTED BY: Westfahl & Hermann		DATE COLLECTION: 4/24/70		
GENERAL REGION COLLECTION: Guide Seamount		LATITUDE: 36 -56.4 N	LONGITUDE: 123 - 14.6 W	
WATER DEPTH: 1495 Fath 2734 Meters	HOW OBTAINED: Precision Fath	ACCURACY: No Correction		
CORING TOOL MAKE: Ewing	TYPE: Gravity	LENGTH CORE BARREL: 10 Ft.	WEIGHT: 450 Lbs.	
ESTIMATED PENETRATION: 12 Ft.	LENGTH CORE RECOVERED: 57 In.	GROSS RECOVERY RATIO (%) 39.6		
MIN INSIDE DIA BARREL: 2.34 In.	MIN INSIDE DIA CUTTER 2.36 In.	INSIDE CLEARANCE RATIO (%) -.85	AREA RATIO(%)	
MAX OUTSIDE DIA BARREL: 2.77 In.	MAX OUTSIDE DIA CUTTER 2.38 In.	OUTSIDE CLEARANCE RATIO (%) 21.85	104	
GROSS SEDIMENT FACIES: Pelagic	ORIGIN: Terrigenous			
RELATION TO TOPOGRAPHY: Slope near base of Seamount				
STRATIGRAPHIC SIGNIFICANCE None				
REMARKS - SIGNIFICANCE OF COLOR, TEXTURE, STRUCTURE VARIATIONS: Uniform grayish green color -- smooth greasy texture except around the 50 inch section of core which was gritty				

INTERVAL (inches)	COLOR (GSA No.)	ODOR	BULK WET DENSITY (gm/cc)	VANE SHEAR STRENGTH (psi)	REMOLDED STRENGTH (psi)	SENSITIVITY	WATER CONTENT (%)	SPECIFIC GRAVITY SOLIDS	DRY DENSITY (gm/cc)	VOID RATIO	POROSITY (%)
0-3	5GY3/2	H_2S	1.25	0.178	0.068	2.61	190	2.40	0.431	4.56	82.0
3-6	5GY3/2	H_2S	1.29	0.375	0.085	4.39	174	2.57	0.469	4.49	81.8
6-9	5GY3/2	H_2S	1.29	0.368	0.116	3.17	178	2.67	0.463	4.76	82.7
9-12	5GY3/2	H_2S	1.33	0.410	0.133	3.08	166	2.99	0.501	4.97	83.2
12-15	5GY3/2	H_2S	1.34	0.376	0.154	2.74	158	2.94	0.520	4.66	82.3
15-18	5GY3/2	H_2S	1.31	0.478	0.116	4.12	153	2.45	0.517	3.75	79.6
18-21	5GY3/2	H_2S	1.32	0.290	0.082	3.55	159	2.66	0.509	4.23	80.9
21-24	5GY3/2	H_2S	1.32	0.392	0.068	5.75	159	2.73	0.511	4.35	81.3
24-27	5GY3/2	H_2S	1.33	0.324	0.096	3.39	161	2.80	0.509	4.49	81.8
27-30	5GY3/2	H_2S	1.33	0.409	0.072	5.71	153	2.76	0.527	4.23	80.9
30-33	5GY3/2	H_2S	1.31	0.420	0.079	5.35	156	2.54	0.511	3.96	79.8
33-36	5GY3/2	H_2S	1.35	0.413	0.065	6.37	146	2.78	0.549	4.06	80.2
36-39	5GY3/2	H_2S	1.33	0.348	0.075	4.63	149	2.61	0.533	3.90	79.6
39-42	5GY3/2	H_2S	1.36	0.467	0.153	3.70	141	2.76	0.565	3.88	79.5
42-45	5GY3/2	H_2S	1.35	0.386	0.153	3.05	137	2.61	0.570	3.58	78.1
45-48	5GY3/2	H_2S	1.38	0.513	0.113	4.54	116	2.41	0.637	2.78	73.6
48-51	5GY3/2	H_2S	1.46	0.461	0.068	6.75	78.6	2.29	0.818	1.80	64.3
51-54	5GY3/2	H_2S	1.41	0.512	0.103	5.17	116	2.68	0.653	3.10	75.6
54-57	5GY3/2	H_2S	1.38	0.529	0.113	4.70	123	2.53	0.617	3.10	75.6

NOTES:

VESSEL: USNS BARTLETT	CRUISE NO: 137006	STATION NO: 13	CORE NO: 10H
COLLECTED BY: Westfahl & Hermann		DATE COLLECTION: 4/24/70	
GENERAL REGION COLLECTION: Guide Seamount		LATITUDE: 36 - 55.4 N	LONGITUDE: 123 -13.4 W
WATER DEPTH: 1600 Fath 2924 Meters	HOW OBTAINED: Precision Fath	ACCURACY: No Correction	
CORING TOOL MAKE: Ewing	TYPE: Gravity	LENGTH CORE BARREL: 10 Ft.	WEIGHT: 450 Lbs.
ESTIMATED PENETRATION: 10 Ft.	LENGTH CORE RECOVERED: 48	GROSS RECOVERY RATIO (%) 40	

MIN INSIDE DIA BARREL: 2.34 In.	MIN INSIDE DIA CUTTER 2.36 In.	INSIDE CLEARANCE RATIO (%) -.85	AREA RATIO(%)
MAX OUTSIDE DIA BARREL: 2.77 In	MAX OUTSIDE DIA CUTTER 2.38 In.	OUTSIDE CLEARANCE RATIO (%) 21.85	104

GROSS SEDIMENT FACIES: Pelagic ORIGIN: Terrigenous

RELATION TO TOPOGRAPHY: Base of Seamount

STRATIGRAPHIC SIGNIFICANCE: None

REMARKS - SIGNIFICANCE OF COLOR, TEXTURE, STRUCTURE VARIATIONS: Uniform grayish green color -- smooth greasy texture -- no structural variations

INTERVAL (inches)	COLOR (GSA No.)	ODOR	BULK WET DENSITY (gm/cc)	VANE SHEAR STRENGTH (psi)	REMOLDED STRENGTH (psi)	SENSITIVITY	WATER CONTENT (%)	SPECIFIC GRAVITY SOLIDS	DRY DENSITY (gm/cc)	VOID RATIO	POROSITY (%)
0-3	5GY3/2	H_2S	1.21	0.082	0.050	1.65	212	2.15	0.386	4.56	82.0
3-6	5GY3/2	H_2S	1.26	0.461	0.109	4.22	185	2.46	0.443	4.54	82.0
6-9	5GY3/2	H_2S	1.29	0.345	0.092	3.74	192	2.78	0.440	5.31	84.2
9-12	5GY3/2	H_2S	1.30	0.383	0.092	4.14	176	2.68	0.469	4.71	82.5
12-15	5GY3/2	H_2S	1.33	0.341	0.092	3.71	157	2.79	0.518	4.39	81.4
15-18	5GY3/2	H_2S	1.29	0.392	0.065	6.05	188	2.78	0.447	5.22	83.9
18-21	5GY3/2	H_2S	1.30	0.437	0.082	5.33	178	2.75	0.467	4.89	83.0
21-24	5GY3/2	H_2S	1.32	0.570	0.126	4.51	172	2.93	0.485	5.03	83.4
24-27	5GY3/2	H_2S	1.28	0.639	0.138	4.64	212	3.13	0.409	6.66	86.9
27-30	5GY3/2	H_2S	1.33	0.795	0.161	4.94	166	2.95	0.500	4.91	83.1
30-33	5GY3/2	H_2S	1.31	0.641	0.150	4.28	169	2.66	0.487	4.47	81.7
33-36	5GY3/2	H_2S	1.34	0.690	0.140	4.93	157	2.86	0.521	4.52	81.9
36-39	5GY3/2	H_2S	1.32	0.683	0.120	5.51	155	2.57	0.517	3.97	79.9
39-42	5GY3/2	H_2S	1.34	0.508	0.106	4.81	158	2.86	0.519	4.51	81.7
42-45	5GY3/2	H_2S	1.32	0.444	0.099	4.49	162	2.75	0.503	4.46	81.7
45-48	5GY3/2	H_2S	1.33	0.239	0.085	2.80	150	2.65	0.534	4.00	80.0

NOTES:

APPENDIX E

TABLE OF MILLIVOLTS - SHEAR STRENGTH

This Appendix contains a computer program and the generated table of millivolts - shear strength in pounds per square inch for various sized vanes used with the NPS Vane Shear Apparatus.

Computer Program for Generating a Table of Millivolts -- Shear Strength in Pounds per Square Inch for Various Size Vanes

```
      REAL*8 VOLTS
      VANE1=0.45813
      VANE2=0.61780
      VANE3=1.30899
      VANE4=2.09438
      VANE5=2.87978
      VOLTS=0.0
      DO 1000 I=1,5001
      VOLTS=VOLTS + 0.10000 + 1.E-08
      IF(I.EQ.2500) GO TO 500
 600  SHEAR1=VOLTS/(64.0*VANE1)
      SHEAR2=VOLTS/(64.0*VANE2)
      SHEAR3=VOLTS/(64.0*VANE3)
      SHEAR4=VOLTS/(64.0*VANE4)
      SHEAR5=VOLTS/(64.0*VANE5)
      IF(I.EQ.1) GO TO 950
      J=I/50*50
      IF(J.EQ.I) GO TO 950
 900  WRITE (6,1001) VOLTS,SHEAR1,SHEAR2,SHEAR3,SHEAR4,SHEAR5
1001  FORMAT (10X,1F10.1,5F10.3)
      GO TO 1000
 950  WRITE (6,1100)
1100  FORMAT ('1',//////)
1500  WRITE (6,2001)
2001  FORMAT(14X,'RECORDER',3X,'VANE',6X,'VANE',6X,'VANE',6X,'VANE',5X,
     9'VANE')
      WRITE (6.2002)
2002  FORMAT(14X,'READING',3X,'DIA=.5"',3X,'DIA=.5"',3X,'DIA=1"',4X,'DIA
     9=1"',3X,'DIA= 1"')
      WRITE (6,2003)
2003  FORMAT (24X,'HT = 1"',3X,'HT -.5"',3X,'HT=.5"',4X,'HT =1"',3X,'HT
     9=1.5"',/)
```

```
      WRITE (6,2004)
2004  FORMAT(15X,'MILLI-',3X,'SHEAR',5X,'SHEAR',5X,'SHEAR',5X,'SHEAR',4X
     9,'SHEAR')
      WRITE (6,2005)
2005  FORMAT(15X,'VOLTS',3X,'STRENGTH',2X,'STRENGTH',2X,'STRENGTH',2X,
     9'STRENGTH',1X,'STRENGTH')
      WRITE (6,2006)
2006  FORMAT (24X,'(PSI)',5X,'(PSI)',5X,'(PSI)',5X,'(PSI)',5X,'(PSI)',4X,'(PSI)',
     9//)
      GO TO 900
 500  VOLTS=250.0000
      GO TO 600
1000  CONTINUE
      STOP
      END
```

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
0.1	0.003	0.003	0.001	0.001	0.001
0.2	0.007	0.005	0.002	0.001	0.001
0.3	0.010	0.008	0.004	0.002	0.002
0.4	0.014	0.010	0.005	0.003	0.002
0.5	0.017	0.013	0.006	0.004	0.003
0.6	0.020	0.015	0.007	0.004	0.003
0.7	0.024	0.018	0.008	0.005	0.004
0.8	0.027	0.020	0.010	0.006	0.004
0.9	0.031	0.023	0.011	0.007	0.005
1.0	0.034	0.025	0.012	0.007	0.005
1.1	0.038	0.028	0.013	0.008	0.006
1.2	0.041	0.030	0.014	0.009	0.007
1.3	0.044	0.033	0.016	0.010	0.007
1.4	0.048	0.035	0.017	0.010	0.008
1.5	0.051	0.038	0.018	0.011	0.008
1.6	0.055	0.040	0.019	0.012	0.009
1.7	0.058	0.043	0.020	0.013	0.009
1.8	0.061	0.046	0.021	0.013	0.010
1.9	0.065	0.048	0.023	0.014	0.010
2.0	0.068	0.051	0.024	0.015	0.011
2.1	0.072	0.053	0.025	0.016	0.011
2.2	0.075	0.056	0.026	0.016	0.012
2.3	0.078	0.058	0.027	0.017	0.012
2.4	0.082	0.061	0.029	0.018	0.013
2.5	0.085	0.063	0.030	0.019	0.014
2.6	0.089	0.066	0.031	0.019	0.014
2.7	0.092	0.068	0.032	0.020	0.015
2.8	0.095	0.071	0.033	0.021	0.015
2.9	0.099	0.073	0.035	0.022	0.016
3.0	0.102	0.076	0.036	0.022	0.016
3.1	0.106	0.078	0.037	0.023	0.017
3.2	0.109	0.081	0.038	0.024	0.017
3.3	0.113	0.083	0.039	0.025	0.018
3.4	0.116	0.086	0.041	0.025	0.018
3.5	0.119	0.089	0.042	0.026	0.019
3.6	0.123	0.091	0.043	0.027	0.020
3.7	0.126	0.094	0.044	0.028	0.020
3.8	0.130	0.096	0.045	0.028	0.021
3.9	0.133	0.099	0.047	0.029	0.021
4.0	0.136	0.101	0.048	0.030	0.022
4.1	0.140	0.104	0.049	0.031	0.022
4.2	0.143	0.106	0.050	0.031	0.023
4.3	0.147	0.109	0.051	0.032	0.023
4.4	0.150	0.111	0.053	0.033	0.024
4.5	0.153	0.114	0.054	0.034	0.024
4.6	0.157	0.116	0.055	0.034	0.025
4.7	0.160	0.119	0.056	0.035	0.026
4.8	0.164	0.121	0.057	0.036	0.026
4.9	0.167	0.124	0.058	0.037	0.027

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
5.0	0.171	0.126	0.060	0.037	0.027
5.1	0.174	0.129	0.061	0.038	0.028
5.2	0.177	0.132	0.062	0.039	0.028
5.3	0.181	0.134	0.063	0.040	0.029
5.4	0.184	0.137	0.064	0.040	0.029
5.5	0.188	0.139	0.066	0.041	0.030
5.6	0.191	0.142	0.067	0.042	0.030
5.7	0.194	0.144	0.068	0.043	0.031
5.8	0.198	0.147	0.069	0.043	0.031
5.9	0.201	0.149	0.070	0.044	0.032
6.0	0.205	0.152	0.072	0.045	0.033
6.1	0.208	0.154	0.073	0.046	0.033
6.2	0.211	0.157	0.074	0.046	0.034
6.3	0.215	0.159	0.075	0.047	0.034
6.4	0.218	0.162	0.076	0.048	0.035
6.5	0.222	0.164	0.078	0.048	0.035
6.6	0.225	0.167	0.079	0.049	0.036
6.7	0.229	0.169	0.080	0.050	0.036
6.8	0.232	0.172	0.081	0.051	0.037
6.9	0.235	0.175	0.082	0.051	0.037
7.0	0.239	0.177	0.084	0.052	0.038
7.1	0.242	0.180	0.085	0.053	0.039
7.2	0.246	0.182	0.086	0.054	0.039
7.3	0.249	0.185	0.087	0.054	0.040
7.4	0.252	0.187	0.088	0.055	0.040
7.5	0.256	0.190	0.090	0.056	0.041
7.6	0.259	0.192	0.091	0.057	0.041
7.7	0.263	0.195	0.092	0.057	0.042
7.8	0.266	0.197	0.093	0.058	0.042
7.9	0.269	0.200	0.094	0.059	0.043
8.0	0.273	0.202	0.095	0.060	0.043
8.1	0.276	0.205	0.097	0.060	0.044
8.2	0.280	0.207	0.098	0.061	0.044
8.3	0.283	0.210	0.099	0.062	0.045
8.4	0.286	0.212	0.100	0.063	0.046
8.5	0.290	0.215	0.101	0.063	0.046
8.6	0.293	0.218	0.103	0.064	0.047
8.7	0.297	0.220	0.104	0.065	0.047
8.8	0.300	0.223	0.105	0.066	0.048
8.9	0.304	0.225	0.106	0.066	0.048
9.0	0.307	0.228	0.107	0.067	0.049
9.1	0.310	0.230	0.109	0.068	0.049
9.2	0.314	0.233	0.110	0.069	0.050
9.3	0.317	0.235	0.111	0.069	0.050
9.4	0.321	0.238	0.112	0.070	0.051
9.5	0.324	0.240	0.113	0.071	0.052
9.6	0.327	0.243	0.115	0.072	0.052
9.7	0.331	0.245	0.116	0.072	0.053
9.8	0.334	0.248	0.117	0.073	0.053
9.9	0.338	0.250	0.118	0.074	0.054

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
10.0	0.341	0.253	0.119	0.075	0.054
10.1	0.344	0.255	0.121	0.075	0.055
10.2	0.348	0.258	0.122	0.076	0.055
10.3	0.351	0.261	0.123	0.077	0.056
10.4	0.355	0.263	0.124	0.078	0.056
10.5	0.358	0.266	0.125	0.078	0.057
10.6	0.362	0.268	0.127	0.079	0.058
10.7	0.365	0.271	0.128	0.080	0.058
10.8	0.368	0.273	0.129	0.081	0.059
10.9	0.372	0.276	0.130	0.081	0.059
11.0	0.375	0.278	0.131	0.082	0.060
11.1	0.379	0.281	0.132	0.083	0.060
11.2	0.382	0.283	0.134	0.084	0.061
11.3	0.385	0.286	0.135	0.084	0.061
11.4	0.389	0.288	0.136	0.085	0.062
11.5	0.392	0.291	0.137	0.086	0.062
11.6	0.396	0.293	0.138	0.087	0.063
11.7	0.399	0.296	0.140	0.087	0.063
11.8	0.402	0.298	0.141	0.088	0.064
11.9	0.406	0.301	0.142	0.089	0.065
12.0	0.409	0.303	0.143	0.090	0.065
12.1	0.413	0.306	0.144	0.090	0.066
12.2	0.416	0.309	0.146	0.091	0.066
12.3	0.420	0.311	0.147	0.092	0.067
12.4	0.423	0.314	0.148	0.093	0.067
12.5	0.426	0.316	0.149	0.093	0.068
12.6	0.430	0.319	0.150	0.094	0.068
12.7	0.433	0.321	0.152	0.095	0.069
12.8	0.437	0.324	0.153	0.095	0.069
12.9	0.440	0.326	0.154	0.096	0.070
13.0	0.443	0.329	0.155	0.097	0.071
13.1	0.447	0.331	0.156	0.098	0.071
13.2	0.450	0.334	0.158	0.098	0.072
13.3	0.454	0.336	0.159	0.099	0.072
13.4	0.457	0.339	0.160	0.100	0.073
13.5	0.460	0.341	0.161	0.101	0.073
13.6	0.464	0.344	0.162	0.101	0.074
13.7	0.467	0.346	0.164	0.102	0.074
13.8	0.471	0.349	0.165	0.103	0.075
13.9	0.474	0.352	0.166	0.104	0.075
14.0	0.477	0.354	0.167	0.104	0.076
14.1	0.481	0.357	0.168	0.105	0.077
14.2	0.484	0.359	0.170	0.106	0.077
14.3	0.488	0.362	0.171	0.107	0.078
14.4	0.491	0.364	0.172	0.107	0.078
14.5	0.495	0.367	0.173	0.108	0.079
14.6	0.498	0.369	0.174	0.109	0.079
14.7	0.501	0.372	0.175	0.110	0.080
14.8	0.505	0.374	0.177	0.110	0.080
14.9	0.508	0.377	0.178	0.111	0.081

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
15.0	0.512	0.379	0.179	0.112	0.081
15.1	0.515	0.382	0.180	0.113	0.082
15.2	0.518	0.384	0.181	0.113	0.082
15.3	0.522	0.387	0.183	0.114	0.083
15.4	0.525	0.389	0.184	0.115	0.084
15.5	0.529	0.392	0.185	0.116	0.084
15.6	0.532	0.395	0.186	0.116	0.085
15.7	0.535	0.397	0.187	0.117	0.085
15.8	0.539	0.400	0.189	0.118	0.086
15.9	0.542	0.402	0.190	0.119	0.086
16.0	0.546	0.405	0.191	0.119	0.087
16.1	0.549	0.407	0.192	0.120	0.087
16.2	0.553	0.410	0.193	0.121	0.088
16.3	0.556	0.412	0.195	0.122	0.088
16.4	0.559	0.415	0.196	0.122	0.089
16.5	0.563	0.417	0.197	0.123	0.090
16.6	0.566	0.420	0.198	0.124	0.090
16.7	0.570	0.422	0.199	0.125	0.091
16.8	0.573	0.425	0.201	0.125	0.091
16.9	0.576	0.427	0.202	0.126	0.092
17.0	0.580	0.430	0.203	0.127	0.092
17.1	0.583	0.432	0.204	0.128	0.093
17.2	0.587	0.435	0.205	0.128	0.093
17.3	0.590	0.438	0.207	0.129	0.094
17.4	0.593	0.440	0.208	0.130	0.094
17.5	0.597	0.443	0.209	0.131	0.095
17.6	0.600	0.445	0.210	0.131	0.095
17.7	0.604	0.448	0.211	0.132	0.096
17.8	0.607	0.450	0.212	0.133	0.097
17.9	0.610	0.453	0.214	0.134	0.097
18.0	0.614	0.455	0.215	0.134	0.098
18.1	0.617	0.458	0.216	0.135	0.098
18.2	0.621	0.460	0.217	0.136	0.099
18.3	0.624	0.463	0.218	0.137	0.099
18.4	0.628	0.465	0.220	0.137	0.100
18.5	0.631	0.468	0.221	0.138	0.100
18.6	0.634	0.470	0.222	0.139	0.101
18.7	0.638	0.473	0.223	0.140	0.101
18.8	0.641	0.475	0.224	0.140	0.102
18.9	0.645	0.478	0.226	0.141	0.103
19.0	0.648	0.481	0.227	0.142	0.103
19.1	0.651	0.483	0.228	0.142	0.104
19.2	0.655	0.486	0.229	0.143	0.104
19.3	0.658	0.488	0.230	0.144	0.105
19.4	0.662	0.491	0.232	0.145	0.105
19.5	0.665	0.493	0.233	0.145	0.106
19.6	0.668	0.496	0.234	0.146	0.106
19.7	0.672	0.498	0.235	0.147	0.107
19.8	0.675	0.501	0.236	0.148	0.107
19.9	0.679	0.503	0.238	0.148	0.108

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
20.0	0.682	0.506	0.239	0.149	0.109
20.1	0.686	0.508	0.240	0.150	0.109
20.2	0.689	0.511	0.241	0.151	0.110
20.3	0.692	0.513	0.242	0.151	0.110
20.4	0.696	0.516	0.244	0.152	0.111
20.5	0.699	0.518	0.245	0.153	0.111
20.6	0.703	0.521	0.246	0.154	0.112
20.7	0.706	0.524	0.247	0.154	0.112
20.8	0.709	0.526	0.248	0.155	0.113
20.9	0.713	0.529	0.249	0.156	0.113
21.0	0.716	0.531	0.251	0.157	0.114
21.1	0.720	0.534	0.252	0.157	0.114
21.2	0.723	0.536	0.253	0.158	0.115
21.3	0.726	0.539	0.254	0.159	0.116
21.4	0.730	0.541	0.255	0.160	0.116
21.5	0.733	0.544	0.257	0.160	0.117
21.6	0.737	0.546	0.258	0.161	0.117
21.7	0.740	0.549	0.259	0.162	0.118
21.8	0.744	0.551	0.260	0.163	0.118
21.9	0.747	0.554	0.261	0.163	0.119
22.0	0.750	0.556	0.263	0.164	0.119
22.1	0.754	0.559	0.264	0.165	0.120
22.2	0.757	0.561	0.265	0.166	0.120
22.3	0.761	0.564	0.266	0.166	0.121
22.4	0.764	0.567	0.267	0.167	0.122
22.5	0.767	0.569	0.269	0.168	0.122
22.6	0.771	0.572	0.270	0.169	0.123
22.7	0.774	0.574	0.271	0.169	0.123
22.8	0.778	0.577	0.272	0.170	0.124
22.9	0.781	0.579	0.273	0.171	0.124
23.0	0.784	0.582	0.275	0.172	0.125
23.1	0.788	0.584	0.276	0.172	0.125
23.2	0.791	0.587	0.277	0.173	0.126
23.3	0.795	0.589	0.278	0.174	0.126
23.4	0.798	0.592	0.279	0.175	0.127
23.5	0.801	0.594	0.281	0.175	0.128
23.6	0.805	0.597	0.282	0.176	0.128
23.7	0.808	0.599	0.283	0.177	0.129
23.8	0.812	0.602	0.284	0.178	0.129
23.9	0.815	0.604	0.285	0.178	0.130
24.0	0.819	0.607	0.286	0.179	0.130
24.1	0.822	0.610	0.288	0.180	0.131
24.2	0.825	0.612	0.289	0.181	0.131
24.3	0.829	0.615	0.290	0.181	0.132
24.4	0.832	0.617	0.291	0.182	0.132
24.5	0.836	0.620	0.292	0.183	0.133
24.6	0.839	0.622	0.294	0.184	0.133
24.7	0.842	0.625	0.295	0.184	0.134
24.8	0.846	0.627	0.296	0.185	0.135
24.9	0.849	0.630	0.297	0.186	0.135

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
25.0	0.853	0.632	0.298	0.187	0.136
25.1	0.856	0.635	0.300	0.187	0.136
25.2	0.859	0.637	0.301	0.188	0.137
25.3	0.863	0.640	0.302	0.189	0.137
25.4	0.866	0.642	0.303	0.189	0.138
25.5	0.870	0.645	0.304	0.190	0.138
25.6	0.873	0.647	0.306	0.191	0.139
25.7	0.877	0.650	0.307	0.192	0.139
25.8	0.880	0.653	0.308	0.192	0.140
25.9	0.883	0.655	0.309	0.193	0.141
26.0	0.887	0.658	0.310	0.194	0.141
26.1	0.890	0.660	0.312	0.195	0.142
26.2	0.894	0.663	0.313	0.195	0.142
26.3	0.897	0.665	0.314	0.196	0.143
26.4	0.900	0.668	0.315	0.197	0.143
26.5	0.904	0.670	0.316	0.198	0.144
26.6	0.907	0.673	0.318	0.198	0.144
26.7	0.911	0.675	0.319	0.199	0.145
26.8	0.914	0.678	0.320	0.200	0.145
26.9	0.917	0.680	0.321	0.201	0.146
27.0	0.921	0.683	0.322	0.201	0.146
27.1	0.924	0.685	0.323	0.202	0.147
27.2	0.928	0.688	0.325	0.203	0.148
27.3	0.931	0.690	0.326	0.204	0.148
27.4	0.935	0.693	0.327	0.204	0.149
27.5	0.938	0.696	0.328	0.205	0.149
27.6	0.941	0.698	0.329	0.206	0.150
27.7	0.945	0.701	0.331	0.207	0.150
27.8	0.948	0.703	0.332	0.207	0.151
27.9	0.952	0.706	0.333	0.208	0.151
28.0	0.955	0.708	0.334	0.209	0.152
28.1	0.958	0.711	0.335	0.210	0.152
28.2	0.962	0.713	0.337	0.210	0.153
28.3	0.965	0.716	0.338	0.211	0.154
28.4	0.969	0.718	0.339	0.212	0.154
28.5	0.972	0.721	0.340	0.213	0.155
28.6	0.975	0.723	0.341	0.213	0.155
28.7	0.979	0.726	0.343	0.214	0.156
28.8	0.982	0.728	0.344	0.215	0.156
28.9	0.986	0.731	0.345	0.216	0.157
29.0	0.989	0.733	0.346	0.216	0.157
29.1	0.992	0.736	0.347	0.217	0.158
29.2	0.996	0.739	0.349	0.218	0.158
29.3	0.999	0.741	0.350	0.219	0.159
29.4	1.003	0.744	0.351	0.219	0.160
29.5	1.006	0.746	0.352	0.220	0.160
29.6	1.010	0.749	0.353	0.221	0.161
29.7	1.013	0.751	0.355	0.222	0.161
29.8	1.016	0.754	0.356	0.222	0.162
29.9	1.020	0.756	0.357	0.223	0.162

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
30.0	1.023	0.759	0.358	0.224	0.163
30.1	1.027	0.761	0.359	0.225	0.163
30.2	1.030	0.764	0.360	0.225	0.164
30.3	1.033	0.766	0.362	0.226	0.164
30.4	1.037	0.769	0.363	0.227	0.165
30.5	1.040	0.771	0.364	0.228	0.165
30.6	1.044	0.774	0.365	0.228	0.166
30.7	1.047	0.776	0.366	0.229	0.167
30.8	1.050	0.779	0.368	0.230	0.167
30.9	1.054	0.782	0.369	0.231	0.168
31.0	1.057	0.784	0.370	0.231	0.168
31.1	1.061	0.787	0.371	0.232	0.169
31.2	1.064	0.789	0.372	0.233	0.169
31.3	1.068	0.792	0.374	0.234	0.170
31.4	1.071	0.794	0.375	0.234	0.170
31.5	1.074	0.797	0.376	0.235	0.171
31.6	1.078	0.799	0.377	0.236	0.171
31.7	1.081	0.802	0.378	0.236	0.172
31.8	1.085	0.804	0.380	0.237	0.173
31.9	1.088	0.807	0.381	0.238	0.173
32.0	1.091	0.809	0.382	0.239	0.174
32.1	1.095	0.812	0.383	0.239	0.174
32.2	1.098	0.814	0.384	0.240	0.175
32.3	1.102	0.817	0.386	0.241	0.175
32.4	1.105	0.819	0.387	0.242	0.176
32.5	1.108	0.822	0.388	0.242	0.176
32.6	1.112	0.824	0.389	0.243	0.177
32.7	1.115	0.827	0.390	0.244	0.177
32.8	1.119	0.830	0.392	0.245	0.178
32.9	1.122	0.832	0.393	0.245	0.179
33.0	1.125	0.835	0.394	0.246	0.179
33.1	1.129	0.837	0.395	0.247	0.180
33.2	1.132	0.840	0.396	0.248	0.180
33.3	1.136	0.842	0.397	0.248	0.181
33.4	1.139	0.845	0.399	0.249	0.181
33.5	1.143	0.847	0.400	0.250	0.182
33.6	1.146	0.850	0.401	0.251	0.182
33.7	1.149	0.852	0.402	0.251	0.183
33.8	1.153	0.855	0.403	0.252	0.183
33.9	1.156	0.857	0.405	0.253	0.184
34.0	1.160	0.860	0.406	0.254	0.184
34.1	1.163	0.862	0.407	0.254	0.185
34.2	1.166	0.865	0.408	0.255	0.186
34.3	1.170	0.867	0.409	0.256	0.186
34.4	1.173	0.870	0.411	0.257	0.187
34.5	1.177	0.873	0.412	0.257	0.187
34.6	1.180	0.875	0.413	0.258	0.188
34.7	1.183	0.878	0.414	0.259	0.188
34.8	1.187	0.880	0.415	0.260	0.189
34.9	1.190	0.883	0.417	0.260	0.189

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
35.0	1.194	0.885	0.418	0.261	0.190
35.1	1.197	0.888	0.419	0.262	0.190
35.2	1.201	0.890	0.420	0.263	0.191
35.3	1.204	0.893	0.421	0.263	0.192
35.4	1.207	0.895	0.423	0.264	0.192
35.5	1.211	0.898	0.424	0.265	0.193
35.6	1.214	0.900	0.425	0.266	0.193
35.7	1.218	0.903	0.426	0.266	0.194
35.8	1.221	0.905	0.427	0.267	0.194
35.9	1.224	0.908	0.429	0.268	0.195
36.0	1.228	0.910	0.430	0.269	0.195
36.1	1.231	0.913	0.431	0.269	0.196
36.2	1.235	0.916	0.432	0.270	0.196
36.3	1.238	0.918	0.433	0.271	0.197
36.4	1.241	0.921	0.434	0.272	0.197
36.5	1.245	0.923	0.436	0.272	0.198
36.6	1.248	0.926	0.437	0.273	0.199
36.7	1.252	0.928	0.438	0.274	0.199
36.8	1.255	0.931	0.439	0.275	0.200
36.9	1.259	0.933	0.440	0.275	0.200
37.0	1.262	0.936	0.442	0.276	0.201
37.1	1.265	0.938	0.443	0.277	0.201
37.2	1.269	0.941	0.444	0.278	0.202
37.3	1.272	0.943	0.445	0.278	0.202
37.4	1.276	0.946	0.446	0.279	0.203
37.5	1.279	0.948	0.448	0.280	0.203
37.6	1.282	0.951	0.449	0.281	0.204
37.7	1.286	0.953	0.450	0.281	0.205
37.8	1.289	0.956	0.451	0.282	0.205
37.9	1.293	0.959	0.452	0.283	0.206
38.0	1.296	0.961	0.454	0.283	0.206
38.1	1.299	0.964	0.455	0.284	0.207
38.2	1.303	0.966	0.456	0.285	0.207
38.3	1.306	0.969	0.457	0.286	0.208
38.4	1.310	0.971	0.458	0.286	0.208
38.5	1.313	0.974	0.460	0.287	0.209
38.6	1.316	0.976	0.461	0.288	0.209
38.7	1.320	0.979	0.462	0.289	0.210
38.8	1.323	0.981	0.463	0.289	0.211
38.9	1.327	0.984	0.464	0.290	0.211
39.0	1.330	0.986	0.466	0.291	0.212
39.1	1.334	0.989	0.467	0.292	0.212
39.2	1.337	0.991	0.468	0.292	0.213
39.3	1.340	0.994	0.469	0.293	0.213
39.4	1.344	0.996	0.470	0.294	0.214
39.5	1.347	0.999	0.471	0.295	0.214
39.6	1.351	1.002	0.473	0.295	0.215
39.7	1.354	1.004	0.474	0.296	0.215
39.8	1.357	1.007	0.475	0.297	0.216
39.9	1.361	1.009	0.476	0.298	0.216

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
40.0	1.364	1.012	0.477	0.298	0.217
40.1	1.368	1.014	0.479	0.299	0.218
40.2	1.371	1.017	0.480	0.300	0.218
40.3	1.374	1.019	0.481	0.301	0.219
40.4	1.378	1.022	0.482	0.301	0.219
40.5	1.381	1.024	0.483	0.302	0.220
40.6	1.385	1.027	0.485	0.303	0.220
40.7	1.388	1.029	0.486	0.304	0.221
40.8	1.392	1.032	0.487	0.304	0.221
40.9	1.395	1.034	0.488	0.305	0.222
41.0	1.398	1.037	0.489	0.306	0.222
41.1	1.402	1.039	0.491	0.307	0.223
41.2	1.405	1.042	0.492	0.307	0.224
41.3	1.409	1.045	0.493	0.308	0.224
41.4	1.412	1.047	0.494	0.309	0.225
41.5	1.415	1.050	0.495	0.310	0.225
41.6	1.419	1.052	0.497	0.310	0.226
41.7	1.422	1.055	0.498	0.311	0.226
41.8	1.426	1.057	0.499	0.312	0.227
41.9	1.429	1.060	0.500	0.313	0.227
42.0	1.432	1.062	0.501	0.313	0.228
42.1	1.436	1.065	0.503	0.314	0.228
42.2	1.439	1.067	0.504	0.315	0.229
42.3	1.443	1.070	0.505	0.316	0.230
42.4	1.446	1.072	0.506	0.316	0.230
42.5	1.450	1.075	0.507	0.317	0.231
42.6	1.453	1.077	0.509	0.318	0.231
42.7	1.456	1.080	0.510	0.319	0.232
42.8	1.460	1.082	0.511	0.319	0.232
42.9	1.463	1.085	0.512	0.320	0.233
43.0	1.467	1.088	0.513	0.321	0.233
43.1	1.470	1.090	0.514	0.322	0.234
43.2	1.473	1.093	0.516	0.322	0.234
43.3	1.477	1.095	0.517	0.323	0.235
43.4	1.480	1.098	0.518	0.324	0.235
43.5	1.484	1.100	0.519	0.325	0.236
43.6	1.487	1.103	0.520	0.325	0.237
43.7	1.490	1.105	0.522	0.326	0.237
43.8	1.494	1.108	0.523	0.327	0.238
43.9	1.497	1.110	0.524	0.328	0.238
44.0	1.501	1.113	0.525	0.328	0.239
44.1	1.504	1.115	0.526	0.329	0.239
44.2	1.507	1.118	0.528	0.330	0.240
44.3	1.511	1.120	0.529	0.330	0.240
44.4	1.514	1.123	0.530	0.331	0.241
44.5	1.518	1.125	0.531	0.332	0.241
44.6	1.521	1.128	0.532	0.333	0.242
44.7	1.525	1.131	0.534	0.333	0.243
44.8	1.528	1.133	0.535	0.334	0.243
44.9	1.531	1.136	0.536	0.335	0.244

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
45.0	1.535	1.138	0.537	0.336	0.244
45.1	1.538	1.141	0.538	0.336	0.245
45.2	1.542	1.143	0.540	0.337	0.245
45.3	1.545	1.146	0.541	0.338	0.246
45.4	1.548	1.148	0.542	0.339	0.246
45.5	1.552	1.151	0.543	0.339	0.247
45.6	1.555	1.153	0.544	0.340	0.247
45.7	1.559	1.156	0.546	0.341	0.248
45.8	1.562	1.158	0.547	0.342	0.248
45.9	1.565	1.161	0.548	0.342	0.249
46.0	1.569	1.163	0.549	0.343	0.250
46.1	1.572	1.166	0.550	0.344	0.250
46.2	1.576	1.168	0.551	0.345	0.251
46.3	1.579	1.171	0.553	0.345	0.251
46.4	1.583	1.174	0.554	0.346	0.252
46.5	1.586	1.176	0.555	0.347	0.252
46.6	1.589	1.179	0.556	0.348	0.253
46.7	1.593	1.181	0.557	0.348	0.253
46.8	1.596	1.184	0.559	0.349	0.254
46.9	1.600	1.186	0.560	0.350	0.254
47.0	1.603	1.189	0.561	0.351	0.255
47.1	1.606	1.191	0.562	0.351	0.256
47.2	1.610	1.194	0.563	0.352	0.256
47.3	1.613	1.196	0.565	0.353	0.257
47.4	1.617	1.199	0.566	0.354	0.257
47.5	1.620	1.201	0.567	0.354	0.258
47.6	1.623	1.204	0.568	0.355	0.258
47.7	1.627	1.206	0.569	0.356	0.259
47.8	1.630	1.209	0.571	0.357	0.259
47.9	1.634	1.211	0.572	0.357	0.260
48.0	1.637	1.214	0.573	0.358	0.260
48.1	1.641	1.217	0.574	0.359	0.261
48.2	1.644	1.219	0.575	0.360	0.262
48.3	1.647	1.222	0.577	0.360	0.262
48.4	1.651	1.224	0.578	0.361	0.263
48.5	1.654	1.227	0.579	0.362	0.263
48.6	1.658	1.229	0.580	0.363	0.264
48.7	1.661	1.232	0.581	0.363	0.264
48.8	1.664	1.234	0.583	0.364	0.265
48.9	1.668	1.237	0.584	0.365	0.265
49.0	1.671	1.239	0.585	0.366	0.266
49.1	1.675	1.242	0.586	0.366	0.266
49.2	1.678	1.244	0.587	0.367	0.267
49.3	1.681	1.247	0.588	0.368	0.267
49.4	1.685	1.249	0.590	0.369	0.268
49.5	1.688	1.252	0.591	0.369	0.269
49.6	1.692	1.254	0.592	0.370	0.269
49.7	1.695	1.257	0.593	0.371	0.270
49.8	1.698	1.260	0.594	0.372	0.270
49.9	1.702	1.262	0.596	0.372	0.271

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
50.0	1.705	1.265	0.597	0.373	0.271
50.1	1.709	1.267	0.598	0.374	0.272
50.2	1.712	1.270	0.599	0.375	0.272
50.3	1.716	1.272	0.600	0.375	0.273
50.4	1.719	1.275	0.602	0.376	0.273
50.5	1.722	1.277	0.603	0.377	0.274
50.6	1.726	1.280	0.604	0.377	0.275
50.7	1.729	1.282	0.605	0.378	0.275
50.8	1.733	1.285	0.606	0.379	0.276
50.9	1.736	1.287	0.608	0.380	0.276
51.0	1.739	1.290	0.609	0.380	0.277
51.1	1.743	1.292	0.610	0.381	0.277
51.2	1.746	1.295	0.611	0.382	0.278
51.3	1.750	1.297	0.612	0.383	0.278
51.4	1.753	1.300	0.614	0.383	0.279
51.5	1.756	1.303	0.615	0.384	0.279
51.6	1.760	1.305	0.616	0.385	0.280
51.7	1.763	1.308	0.617	0.386	0.281
51.8	1.767	1.310	0.618	0.386	0.281
51.9	1.770	1.313	0.620	0.387	0.282
52.0	1.774	1.315	0.621	0.388	0.282
52.1	1.777	1.318	0.622	0.389	0.283
52.2	1.780	1.320	0.623	0.389	0.283
52.3	1.784	1.323	0.624	0.390	0.284
52.4	1.787	1.325	0.625	0.391	0.284
52.5	1.791	1.328	0.627	0.392	0.285
52.6	1.794	1.330	0.628	0.392	0.285
52.7	1.797	1.333	0.629	0.393	0.286
52.8	1.801	1.335	0.630	0.394	0.286
52.9	1.804	1.338	0.631	0.395	0.287
53.0	1.808	1.340	0.633	0.395	0.288
53.1	1.811	1.343	0.634	0.396	0.288
53.2	1.814	1.345	0.635	0.397	0.289
53.3	1.818	1.348	0.636	0.398	0.289
53.4	1.821	1.351	0.637	0.398	0.290
53.5	1.825	1.353	0.639	0.399	0.290
53.6	1.828	1.356	0.640	0.400	0.291
53.7	1.831	1.358	0.641	0.401	0.291
53.8	1.835	1.361	0.642	0.401	0.292
53.9	1.838	1.363	0.643	0.402	0.292
54.0	1.842	1.366	0.645	0.403	0.293
54.1	1.845	1.368	0.646	0.404	0.294
54.2	1.849	1.371	0.647	0.404	0.294
54.3	1.852	1.373	0.648	0.405	0.295
54.4	1.855	1.376	0.649	0.406	0.295
54.5	1.859	1.378	0.651	0.407	0.296
54.6	1.862	1.381	0.652	0.407	0.296
54.7	1.866	1.383	0.653	0.408	0.297
54.8	1.869	1.386	0.654	0.409	0.297
54.9	1.872	1.388	0.655	0.410	0.298

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
55.0	1.876	1.391	0.657	0.410	0.298
55.1	1.879	1.394	0.658	0.411	0.299
55.2	1.883	1.396	0.659	0.412	0.300
55.3	1.886	1.399	0.660	0.413	0.300
55.4	1.889	1.401	0.661	0.413	0.301
55.5	1.893	1.404	0.662	0.414	0.301
55.6	1.896	1.406	0.664	0.415	0.302
55.7	1.900	1.409	0.665	0.416	0.302
55.8	1.903	1.411	0.666	0.416	0.303
55.9	1.907	1.414	0.667	0.417	0.303
56.0	1.910	1.416	0.668	0.418	0.304
56.1	1.913	1.419	0.670	0.419	0.304
56.2	1.917	1.421	0.671	0.419	0.305
56.3	1.920	1.424	0.672	0.420	0.305
56.4	1.924	1.426	0.673	0.421	0.306
56.5	1.927	1.429	0.674	0.422	0.307
56.6	1.930	1.431	0.676	0.422	0.307
56.7	1.934	1.434	0.677	0.423	0.308
56.8	1.937	1.437	0.678	0.424	0.308
56.9	1.941	1.439	0.679	0.424	0.309
57.0	1.944	1.442	0.680	0.425	0.309
57.1	1.947	1.444	0.682	0.426	0.310
57.2	1.951	1.447	0.683	0.427	0.310
57.3	1.954	1.449	0.684	0.427	0.311
57.4	1.958	1.452	0.685	0.428	0.311
57.5	1.961	1.454	0.686	0.429	0.312
57.6	1.965	1.457	0.688	0.430	0.313
57.7	1.968	1.459	0.689	0.430	0.313
57.8	1.971	1.462	0.690	0.431	0.314
57.9	1.975	1.464	0.691	0.432	0.314
58.0	1.978	1.467	0.692	0.433	0.315
58.1	1.982	1.469	0.694	0.433	0.315
58.2	1.985	1.472	0.695	0.434	0.316
58.3	1.988	1.474	0.696	0.435	0.316
58.4	1.992	1.477	0.697	0.436	0.317
58.5	1.995	1.480	0.698	0.436	0.317
58.6	1.999	1.482	0.699	0.437	0.318
58.7	2.002	1.485	0.701	0.438	0.318
58.8	2.005	1.487	0.702	0.439	0.319
58.9	2.009	1.490	0.703	0.439	0.320
59.0	2.012	1.492	0.704	0.440	0.320
59.1	2.016	1.495	0.705	0.441	0.321
59.2	2.019	1.497	0.707	0.442	0.321
59.3	2.022	1.500	0.708	0.442	0.322
59.4	2.026	1.502	0.709	0.443	0.322
59.5	2.029	1.505	0.710	0.444	0.323
59.6	2.033	1.507	0.711	0.445	0.323
59.7	2.036	1.510	0.713	0.445	0.324
59.8	2.040	1.512	0.714	0.446	0.324
59.9	2.043	1.515	0.715	0.447	0.325

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
60.0	2.046	1.517	0.716	0.448	0.326
60.1	2.050	1.520	0.717	0.448	0.326
60.2	2.053	1.523	0.719	0.449	0.327
60.3	2.057	1.525	0.720	0.450	0.327
60.4	2.060	1.528	0.721	0.451	0.328
60.5	2.063	1.530	0.722	0.451	0.328
60.6	2.067	1.533	0.723	0.452	0.329
60.7	2.070	1.535	0.725	0.453	0.329
60.8	2.074	1.538	0.726	0.454	0.330
60.9	2.077	1.540	0.727	0.454	0.330
61.0	2.080	1.543	0.728	0.455	0.331
61.1	2.084	1.545	0.729	0.456	0.332
61.2	2.087	1.548	0.731	0.457	0.332
61.3	2.091	1.550	0.732	0.457	0.333
61.4	2.094	1.553	0.733	0.458	0.333
61.5	2.098	1.555	0.734	0.459	0.334
61.6	2.101	1.558	0.735	0.460	0.334
61.7	2.104	1.560	0.736	0.460	0.335
61.8	2.108	1.563	0.738	0.461	0.335
61.9	2.111	1.566	0.739	0.462	0.336
62.0	2.115	1.568	0.740	0.463	0.336
62.1	2.118	1.571	0.741	0.463	0.337
62.2	2.121	1.573	0.742	0.464	0.337
62.3	2.125	1.576	0.744	0.465	0.338
62.4	2.128	1.578	0.745	0.466	0.339
62.5	2.132	1.581	0.746	0.466	0.339
62.6	2.135	1.583	0.747	0.467	0.340
62.7	2.138	1.586	0.748	0.468	0.340
62.8	2.142	1.588	0.750	0.469	0.341
62.9	2.145	1.591	0.751	0.469	0.341
63.0	2.149	1.593	0.752	0.470	0.342
63.1	2.152	1.596	0.753	0.471	0.342
63.2	2.156	1.598	0.754	0.471	0.343
63.3	2.159	1.601	0.756	0.472	0.343
63.4	2.162	1.603	0.757	0.473	0.344
63.5	2.166	1.606	0.758	0.474	0.345
63.6	2.169	1.609	0.759	0.474	0.345
63.7	2.173	1.611	0.760	0.475	0.346
63.8	2.176	1.614	0.762	0.476	0.346
63.9	2.179	1.616	0.763	0.477	0.347
64.0	2.183	1.619	0.764	0.477	0.347
64.1	2.186	1.621	0.765	0.478	0.348
64.2	2.190	1.624	0.766	0.479	0.348
64.3	2.193	1.626	0.768	0.480	0.349
64.4	2.196	1.629	0.769	0.480	0.349
64.5	2.200	1.631	0.770	0.481	0.350
64.6	2.203	1.634	0.771	0.482	0.351
64.7	2.207	1.636	0.772	0.483	0.351
64.8	2.210	1.639	0.773	0.483	0.352
64.9	2.213	1.641	0.775	0.484	0.352

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
65.0	2.217	1.644	0.776	0.485	0.353
65.1	2.220	1.646	0.777	0.486	0.353
65.2	2.224	1.649	0.778	0.486	0.354
65.3	2.227	1.652	0.779	0.487	0.354
65.4	2.231	1.654	0.781	0.488	0.355
65.5	2.234	1.657	0.782	0.489	0.355
65.6	2.237	1.659	0.783	0.489	0.356
65.7	2.241	1.662	0.784	0.490	0.356
65.8	2.244	1.664	0.785	0.491	0.357
65.9	2.248	1.667	0.787	0.492	0.358
66.0	2.251	1.669	0.788	0.492	0.358
66.1	2.254	1.672	0.789	0.493	0.359
66.2	2.258	1.674	0.790	0.494	0.359
66.3	2.261	1.677	0.791	0.495	0.360
66.4	2.265	1.679	0.793	0.495	0.360
66.5	2.268	1.682	0.794	0.496	0.361
66.6	2.271	1.684	0.795	0.497	0.361
66.7	2.275	1.687	0.796	0.498	0.362
66.8	2.278	1.689	0.797	0.498	0.362
66.9	2.282	1.692	0.799	0.499	0.363
67.0	2.285	1.695	0.800	0.500	0.364
67.1	2.289	1.697	0.801	0.501	0.364
67.2	2.292	1.700	0.802	0.501	0.365
67.3	2.295	1.702	0.803	0.502	0.365
67.4	2.299	1.705	0.805	0.503	0.366
67.5	2.302	1.707	0.806	0.504	0.366
67.6	2.306	1.710	0.807	0.504	0.367
67.7	2.309	1.712	0.808	0.505	0.367
67.8	2.312	1.715	0.809	0.506	0.368
67.9	2.316	1.717	0.811	0.507	0.368
68.0	2.319	1.720	0.812	0.507	0.369
68.1	2.323	1.722	0.813	0.508	0.369
68.2	2.326	1.725	0.814	0.509	0.370
68.3	2.329	1.727	0.815	0.510	0.371
68.4	2.333	1.730	0.816	0.510	0.371
68.5	2.336	1.732	0.818	0.511	0.372
68.6	2.340	1.735	0.819	0.512	0.372
68.7	2.343	1.738	0.820	0.513	0.373
68.8	2.346	1.740	0.821	0.513	0.373
68.9	2.350	1.743	0.822	0.514	0.374
69.0	2.353	1.745	0.824	0.515	0.374
69.1	2.357	1.748	0.825	0.516	0.375
69.2	2.360	1.750	0.826	0.516	0.375
69.3	2.364	1.753	0.827	0.517	0.376
69.4	2.367	1.755	0.828	0.518	0.377
69.5	2.370	1.758	0.830	0.519	0.377
69.6	2.374	1.760	0.831	0.519	0.378
69.7	2.377	1.763	0.832	0.520	0.378
69.8	2.381	1.765	0.833	0.521	0.379
69.9	2.384	1.768	0.834	0.521	0.379

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
70.0	2.387	1.770	0.836	0.522	0.380
70.1	2.391	1.773	0.837	0.523	0.380
70.2	2.394	1.775	0.838	0.524	0.381
70.3	2.398	1.778	0.839	0.524	0.381
70.4	2.401	1.781	0.840	0.525	0.382
70.5	2.404	1.783	0.842	0.526	0.383
70.6	2.408	1.786	0.843	0.527	0.383
70.7	2.411	1.788	0.844	0.527	0.384
70.8	2.415	1.791	0.845	0.528	0.384
70.9	2.418	1.793	0.846	0.529	0.385
71.0	2.422	1.796	0.848	0.530	0.385
71.1	2.425	1.798	0.849	0.530	0.386
71.2	2.428	1.801	0.850	0.531	0.386
71.3	2.432	1.803	0.851	0.532	0.387
71.4	2.435	1.806	0.852	0.533	0.387
71.5	2.439	1.808	0.853	0.533	0.388
71.6	2.442	1.811	0.855	0.534	0.388
71.7	2.445	1.813	0.856	0.535	0.389
71.8	2.449	1.816	0.857	0.536	0.390
71.9	2.452	1.818	0.858	0.536	0.390
72.0	2.456	1.821	0.859	0.537	0.391
72.1	2.459	1.824	0.861	0.538	0.391
72.2	2.462	1.826	0.862	0.539	0.392
72.3	2.466	1.829	0.863	0.539	0.392
72.4	2.469	1.831	0.864	0.540	0.393
72.5	2.473	1.834	0.865	0.541	0.393
72.6	2.476	1.836	0.867	0.542	0.394
72.7	2.480	1.839	0.868	0.542	0.394
72.8	2.483	1.841	0.369	0.543	0.395
72.9	2.486	1.844	0.870	0.544	0.396
73.0	2.490	1.846	0.871	0.545	0.396
73.1	2.493	1.849	0.873	0.545	0.397
73.2	2.497	1.851	0.874	0.546	0.397
73.3	2.500	1.854	0.875	0.547	0.398
73.4	2.503	1.856	0.876	0.548	0.398
73.5	2.507	1.859	0.877	0.548	0.399
73.6	2.510	1.861	0.879	0.549	0.399
73.7	2.514	1.864	0.880	0.550	0.400
73.8	2.517	1.867	0.881	0.551	0.400
73.9	2.520	1.869	0.882	0.551	0.401
74.0	2.524	1.872	0.883	0.552	0.402
74.1	2.527	1.874	0.885	0.553	0.402
74.2	2.531	1.877	0.886	0.554	0.403
74.3	2.534	1.879	0.887	0.554	0.403
74.4	2.537	1.882	0.888	0.555	0.404
74.5	2.541	1.884	0.889	0.556	0.404
74.6	2.544	1.887	0.890	0.557	0.405
74.7	2.548	1.889	0.892	0.557	0.405
74.8	2.551	1.892	0.893	0.558	0.406
74.9	2.555	1.894	0.894	0.559	0.406

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
75.0	2.558	1.897	0.895	0.560	0.407
75.1	2.561	1.899	0.896	0.560	0.407
75.2	2.565	1.902	0.898	0.561	0.408
75.3	2.568	1.904	0.899	0.562	0.409
75.4	2.572	1.907	0.900	0.563	0.409
75.5	2.575	1.909	0.901	0.563	0.410
75.6	2.578	1.912	0.902	0.564	0.410
75.7	2.582	1.915	0.904	0.565	0.411
75.8	2.585	1.917	0.905	0.566	0.411
75.9	2.589	1.920	0.906	0.566	0.412
76.0	2.592	1.922	0.907	0.567	0.412
76.1	2.595	1.925	0.908	0.568	0.413
76.2	2.599	1.927	0.910	0.568	0.413
76.3	2.602	1.930	0.911	0.569	0.414
76.4	2.606	1.932	0.912	0.570	0.415
76.5	2.609	1.935	0.913	0.571	0.415
76.6	2.613	1.937	0.914	0.571	0.416
76.7	2.616	1.940	0.916	0.572	0.416
76.8	2.619	1.942	0.917	0.573	0.417
76.9	2.623	1.945	0.918	0.574	0.417
77.0	2.626	1.947	0.919	0.574	0.418
77.1	2.630	1.950	0.920	0.575	0.418
77.2	2.633	1.952	0.922	0.576	0.419
77.3	2.636	1.955	0.923	0.577	0.419
77.4	2.640	1.958	0.924	0.577	0.420
77.5	2.643	1.960	0.925	0.578	0.420
77.6	2.647	1.963	0.926	0.579	0.421
77.7	2.650	1.965	0.927	0.580	0.422
77.8	2.653	1.968	0.929	0.580	0.422
77.9	2.657	1.970	0.930	0.581	0.423
78.0	2.660	1.973	0.931	0.582	0.423
78.1	2.664	1.975	0.932	0.583	0.424
78.2	2.667	1.978	0.933	0.583	0.424
78.3	2.671	1.980	0.935	0.584	0.425
78.4	2.674	1.983	0.936	0.585	0.425
78.5	2.677	1.985	0.937	0.586	0.426
78.6	2.681	1.988	0.938	0.586	0.426
78.7	2.684	1.990	0.939	0.587	0.427
78.8	2.688	1.993	0.941	0.588	0.428
78.9	2.691	1.995	0.942	0.589	0.428
79.0	2.694	1.998	0.943	0.589	0.429
79.1	2.698	2.001	0.944	0.590	0.429
79.2	2.701	2.003	0.945	0.591	0.430
79.3	2.705	2.006	0.947	0.592	0.430
79.4	2.708	2.008	0.948	0.592	0.431
79.5	2.711	2.011	0.949	0.593	0.431
79.6	2.715	2.013	0.950	0.594	0.432
79.7	2.718	2.016	0.951	0.595	0.432
79.8	2.722	2.018	0.953	0.595	0.433
79.9	2.725	2.021	0.954	0.596	0.434

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
80.0	2.728	2.023	0.955	0.597	0.434
80.1	2.732	2.026	0.956	0.598	0.435
80.2	2.735	2.028	0.957	0.598	0.435
80.3	2.739	2.031	0.959	0.599	0.436
80.4	2.742	2.033	0.960	0.600	0.436
80.5	2.746	2.036	0.961	0.601	0.437
80.6	2.749	2.038	0.962	0.601	0.437
80.7	2.752	2.041	0.963	0.602	0.438
80.8	2.756	2.044	0.964	0.603	0.438
80.9	2.759	2.046	0.966	0.604	0.439
81.0	2.763	2.049	0.967	0.604	0.439
81.1	2.766	2.051	0.968	0.605	0.440
81.2	2.769	2.054	0.969	0.606	0.441
81.3	2.773	2.056	0.970	0.607	0.441
81.4	2.776	2.059	0.972	0.607	0.442
81.5	2.780	2.061	0.973	0.608	0.442
81.6	2.783	2.064	0.974	0.609	0.443
81.7	2.786	2.066	0.975	0.610	0.443
81.8	2.790	2.069	0.976	0.610	0.444
81.9	2.793	2.071	0.978	0.611	0.444
82.0	2.797	2.074	0.979	0.612	0.445
82.1	2.800	2.076	0.980	0.613	0.445
82.2	2.804	2.079	0.981	0.613	0.446
82.3	2.807	2.081	0.982	0.614	0.447
82.4	2.810	2.084	0.984	0.615	0.447
82.5	2.814	2.087	0.985	0.615	0.448
82.6	2.817	2.089	0.986	0.616	0.448
82.7	2.821	2.092	0.987	0.617	0.449
82.8	2.824	2.094	0.988	0.618	0.449
82.9	2.827	2.097	0.990	0.618	0.450
83.0	2.831	2.099	0.991	0.619	0.450
83.1	2.834	2.102	0.992	0.620	0.451
83.2	2.838	2.104	0.993	0.621	0.451
83.3	2.841	2.107	0.994	0.621	0.452
83.4	2.844	2.109	0.996	0.622	0.453
83.5	2.848	2.112	0.997	0.623	0.453
83.6	2.851	2.114	0.998	0.624	0.454
83.7	2.855	2.117	0.999	0.624	0.454
83.8	2.858	2.119	1.000	0.625	0.455
83.9	2.861	2.122	1.001	0.626	0.455
84.0	2.865	2.124	1.003	0.627	0.456
84.1	2.868	2.127	1.004	0.627	0.456
84.2	2.872	2.130	1.005	0.628	0.457
84.3	2.875	2.132	1.006	0.629	0.457
84.4	2.879	2.135	1.007	0.630	0.458
84.5	2.882	2.137	1.009	0.630	0.458
84.6	2.885	2.140	1.010	0.631	0.459
84.7	2.889	2.142	1.011	0.632	0.460
84.8	2.892	2.145	1.012	0.633	0.460
84.9	2.896	2.147	1.013	0.633	0.461

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
85.0	2.899	2.150	1.015	0.634	0.461
85.1	2.902	2.152	1.016	0.635	0.462
85.2	2.906	2.155	1.017	0.636	0.462
85.3	2.909	2.157	1.018	0.636	0.463
85.4	2.913	2.160	1.019	0.637	0.463
85.5	2.916	2.162	1.021	0.638	0.464
85.6	2.919	2.165	1.022	0.639	0.464
85.7	2.923	2.167	1.023	0.639	0.465
85.8	2.926	2.170	1.024	0.640	0.466
85.9	2.930	2.173	1.025	0.641	0.466
86.0	2.933	2.175	1.027	0.642	0.467
86.1	2.937	2.178	1.028	0.642	0.467
86.2	2.940	2.180	1.029	0.643	0.468
86.3	2.943	2.183	1.030	0.644	0.468
86.4	2.947	2.185	1.031	0.645	0.469
86.5	2.950	2.188	1.033	0.645	0.469
86.6	2.954	2.190	1.034	0.646	0.470
86.7	2.957	2.193	1.035	0.647	0.470
86.8	2.960	2.195	1.036	0.648	0.471
86.9	2.964	2.198	1.037	0.648	0.471
87.0	2.967	2.200	1.038	0.649	0.472
87.1	2.971	2.203	1.040	0.650	0.473
87.2	2.974	2.205	1.041	0.651	0.473
87.3	2.977	2.208	1.042	0.651	0.474
87.4	2.981	2.210	1.043	0.652	0.474
87.5	2.984	2.213	1.044	0.653	0.475
87.6	2.988	2.216	1.046	0.654	0.475
87.7	2.991	2.218	1.047	0.654	0.476
87.8	2.995	2.221	1.048	0.655	0.476
87.9	2.998	2.223	1.049	0.656	0.477
88.0	3.001	2.226	1.050	0.657	0.477
88.1	3.005	2.228	1.052	0.657	0.478
88.2	3.008	2.231	1.053	0.658	0.479
88.3	3.012	2.233	1.054	0.659	0.479
88.4	3.015	2.236	1.055	0.660	0.480
88.5	3.018	2.238	1.056	0.660	0.480
88.6	3.022	2.241	1.058	0.661	0.481
88.7	3.025	2.243	1.059	0.662	0.481
88.8	3.029	2.246	1.060	0.662	0.482
88.9	3.032	2.248	1.061	0.663	0.482
89.0	3.035	2.251	1.062	0.664	0.483
89.1	3.039	2.253	1.064	0.665	0.483
89.2	3.042	2.256	1.065	0.665	0.484
89.3	3.046	2.259	1.066	0.666	0.485
89.4	3.049	2.261	1.067	0.667	0.485
89.5	3.052	2.264	1.068	0.668	0.486
89.6	3.056	2.266	1.070	0.668	0.486
89.7	3.059	2.269	1.071	0.669	0.487
89.8	3.063	2.271	1.072	0.670	0.487
89.9	3.066	2.274	1.073	0.671	0.488

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
90.0	3.070	2.276	1.074	0.671	0.488
90.1	3.073	2.279	1.075	0.672	0.489
90.2	3.076	2.281	1.077	0.673	0.489
90.3	3.080	2.284	1.078	0.674	0.490
90.4	3.083	2.286	1.079	0.674	0.490
90.5	3.087	2.289	1.080	0.675	0.491
90.6	3.090	2.291	1.081	0.676	0.492
90.7	3.093	2.294	1.083	0.677	0.492
90.8	3.097	2.296	1.084	0.677	0.493
90.9	3.100	2.299	1.085	0.678	0.493
91.0	3.104	2.302	1.086	0.679	0.494
91.1	3.107	2.304	1.087	0.680	0.494
91.2	3.110	2.307	1.089	0.680	0.495
91.3	3.114	2.309	1.090	0.681	0.495
91.4	3.117	2.312	1.091	0.682	0.496
91.5	3.121	2.314	1.092	0.683	0.496
91.6	3.124	2.317	1.093	0.683	0.497
91.7	3.128	2.319	1.095	0.684	0.498
91.8	3.131	2.322	1.096	0.685	0.498
91.9	3.134	2.324	1.097	0.686	0.499
92.0	3.138	2.327	1.098	0.686	0.499
92.1	3.141	2.329	1.099	0.687	0.500
92.2	3.145	2.332	1.101	0.688	0.500
92.3	3.148	2.334	1.102	0.689	0.501
92.4	3.151	2.337	1.103	0.689	0.501
92.5	3.155	2.339	1.104	0.690	0.502
92.6	3.158	2.342	1.105	0.691	0.502
92.7	3.162	2.345	1.107	0.692	0.503
92.8	3.165	2.347	1.108	0.692	0.504
92.9	3.168	2.350	1.109	0.693	0.504
93.0	3.172	2.352	1.110	0.694	0.505
93.1	3.175	2.355	1.111	0.695	0.505
93.2	3.179	2.357	1.112	0.695	0.506
93.3	3.182	2.360	1.114	0.696	0.506
93.4	3.186	2.362	1.115	0.697	0.507
93.5	3.189	2.365	1.116	0.698	0.507
93.6	3.192	2.367	1.117	0.698	0.508
93.7	3.196	2.370	1.118	0.699	0.508
93.8	3.199	2.372	1.120	0.700	0.509
93.9	3.203	2.375	1.121	0.701	0.509
94.0	3.206	2.377	1.122	0.701	0.510
94.1	3.209	2.380	1.123	0.702	0.511
94.2	3.213	2.382	1.124	0.703	0.511
94.3	3.216	2.385	1.126	0.704	0.512
94.4	3.220	2.388	1.127	0.704	0.512
94.5	3.223	2.390	1.128	0.705	0.513
94.6	3.226	2.393	1.129	0.706	0.513
94.7	3.230	2.395	1.130	0.707	0.514
94.8	3.233	2.398	1.132	0.707	0.514
94.9	3.237	2.400	1.133	0.708	0.515

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
95.0	3.240	2.403	1.134	0.709	0.515
95.1	3.243	2.405	1.135	0.709	0.516
95.2	3.247	2.408	1.136	0.710	0.517
95.3	3.250	2.410	1.138	0.711	0.517
95.4	3.254	2.413	1.139	0.712	0.518
95.5	3.257	2.415	1.140	0.712	0.518
95.6	3.261	2.418	1.141	0.713	0.519
95.7	3.264	2.420	1.142	0.714	0.519
95.8	3.267	2.423	1.144	0.715	0.520
95.9	3.271	2.425	1.145	0.715	0.520
96.0	3.274	2.428	1.146	0.716	0.521
96.1	3.278	2.430	1.147	0.717	0.521
96.2	3.281	2.433	1.148	0.718	0.522
96.3	3.284	2.436	1.150	0.718	0.523
96.4	3.288	2.438	1.151	0.719	0.523
96.5	3.291	2.441	1.152	0.720	0.524
96.6	3.295	2.443	1.153	0.721	0.524
96.7	3.298	2.446	1.154	0.721	0.525
96.8	3.301	2.448	1.155	0.722	0.525
96.9	3.305	2.451	1.157	0.723	0.526
97.0	3.308	2.453	1.158	0.724	0.526
97.1	3.312	2.456	1.159	0.724	0.527
97.2	3.315	2.458	1.160	0.725	0.527
97.3	3.319	2.461	1.161	0.726	0.528
97.4	3.322	2.463	1.163	0.727	0.528
97.5	3.325	2.466	1.164	0.727	0.529
97.6	3.329	2.468	1.165	0.728	0.530
97.7	3.332	2.471	1.166	0.729	0.530
97.8	3.336	2.473	1.167	0.730	0.531
97.9	3.339	2.476	1.169	0.730	0.531
98.0	3.342	2.479	1.170	0.731	0.532
98.1	3.346	2.481	1.171	0.732	0.532
98.2	3.349	2.484	1.172	0.733	0.533
98.3	3.353	2.486	1.173	0.733	0.533
98.4	3.356	2.489	1.175	0.734	0.534
98.5	3.359	2.491	1.176	0.735	0.534
98.6	3.363	2.494	1.177	0.736	0.535
98.7	3.366	2.496	1.178	0.736	0.536
98.8	3.370	2.499	1.179	0.737	0.536
98.9	3.373	2.501	1.181	0.738	0.537
99.0	3.376	2.504	1.182	0.739	0.537
99.1	3.380	2.506	1.183	0.739	0.538
99.2	3.383	2.509	1.184	0.740	0.538
99.3	3.387	2.511	1.185	0.741	0.539
99.4	3.390	2.514	1.187	0.742	0.539
99.5	3.394	2.516	1.188	0.742	0.540
99.6	3.397	2.519	1.189	0.743	0.540
99.7	3.400	2.522	1.190	0.744	0.541
99.8	3.404	2.524	1.191	0.745	0.541
99.9	3.407	2.527	1.192	0.745	0.542

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
100.0	3.411	2.529	1.194	0.746	0.543
100.1	3.414	2.532	1.195	0.747	0.543
100.2	3.417	2.534	1.196	0.748	0.544
100.3	3.421	2.537	1.197	0.748	0.544
100.4	3.424	2.539	1.198	0.749	0.545
100.5	3.428	2.542	1.200	0.750	0.545
100.6	3.431	2.544	1.201	0.751	0.546
100.7	3.434	2.547	1.202	0.751	0.546
100.8	3.438	2.549	1.203	0.752	0.547
100.9	3.441	2.552	1.204	0.753	0.547
101.0	3.445	2.554	1.206	0.754	0.548
101.1	3.448	2.557	1.207	0.754	0.549
101.2	3.452	2.559	1.208	0.755	0.549
101.3	3.455	2.562	1.209	0.756	0.550
101.4	3.458	2.565	1.210	0.756	0.550
101.5	3.462	2.567	1.212	0.757	0.551
101.6	3.465	2.570	1.213	0.758	0.551
101.7	3.469	2.572	1.214	0.759	0.552
101.8	3.472	2.575	1.215	0.759	0.552
101.9	3.475	2.577	1.216	0.760	0.553
102.0	3.479	2.580	1.218	0.761	0.553
102.1	3.482	2.582	1.219	0.762	0.554
102.2	3.486	2.585	1.220	0.762	0.555
102.3	3.489	2.587	1.221	0.763	0.555
102.4	3.492	2.590	1.222	0.764	0.556
102.5	3.496	2.592	1.224	0.765	0.556
102.6	3.499	2.595	1.225	0.765	0.557
102.7	3.503	2.597	1.226	0.766	0.557
102.8	3.506	2.600	1.227	0.767	0.558
102.9	3.510	2.602	1.228	0.768	0.558
103.0	3.513	2.605	1.229	0.768	0.559
103.1	3.516	2.608	1.231	0.769	0.559
103.2	3.520	2.610	1.232	0.770	0.560
103.3	3.523	2.613	1.233	0.771	0.560
103.4	3.527	2.615	1.234	0.771	0.561
103.5	3.530	2.618	1.235	0.772	0.562
103.6	3.533	2.620	1.237	0.773	0.562
103.7	3.537	2.623	1.238	0.774	0.563
103.8	3.540	2.625	1.239	0.774	0.563
103.9	3.544	2.628	1.240	0.775	0.564
104.0	3.547	2.630	1.241	0.776	0.564
104.1	3.550	2.633	1.243	0.777	0.565
104.2	3.554	2.635	1.244	0.777	0.565
104.3	3.557	2.638	1.245	0.778	0.566
104.4	3.561	2.640	1.246	0.779	0.566
104.5	3.564	2.643	1.247	0.780	0.567
104.6	3.567	2.645	1.249	0.780	0.568
104.7	3.571	2.648	1.250	0.781	0.568
104.8	3.574	2.651	1.251	0.782	0.569
104.9	3.578	2.653	1.252	0.783	0.569

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
105.0	3.581	2.656	1.253	0.783	0.570
105.1	3.585	2.658	1.255	0.784	0.570
105.2	3.588	2.661	1.256	0.785	0.571
105.3	3.591	2.663	1.257	0.786	0.571
105.4	3.595	2.666	1.258	0.786	0.572
105.5	3.598	2.668	1.259	0.787	0.572
105.6	3.602	2.671	1.261	0.788	0.573
105.7	3.605	2.673	1.262	0.789	0.574
105.8	3.608	2.676	1.263	0.789	0.574
105.9	3.612	2.678	1.264	0.790	0.575
106.0	3.615	2.681	1.265	0.791	0.575
106.1	3.619	2.683	1.266	0.792	0.576
106.2	3.622	2.686	1.268	0.792	0.576
106.3	3.625	2.688	1.269	0.793	0.577
106.4	3.629	2.691	1.270	0.794	0.577
106.5	3.632	2.694	1.271	0.795	0.578
106.6	3.636	2.696	1.272	0.795	0.578
106.7	3.639	2.699	1.274	0.796	0.579
106.8	3.643	2.701	1.275	0.797	0.579
106.9	3.646	2.704	1.276	0.798	0.580
107.0	3.649	2.706	1.277	0.798	0.581
107.1	3.653	2.709	1.278	0.799	0.581
107.2	3.656	2.711	1.280	0.800	0.582
107.3	3.660	2.714	1.281	0.801	0.582
107.4	3.663	2.716	1.282	0.801	0.583
107.5	3.666	2.719	1.283	0.802	0.583
107.6	3.670	2.721	1.284	0.803	0.584
107.7	3.673	2.724	1.286	0.803	0.584
107.8	3.677	2.726	1.287	0.804	0.585
107.9	3.680	2.729	1.288	0.805	0.585
108.0	3.683	2.731	1.289	0.806	0.586
108.1	3.687	2.734	1.290	0.806	0.587
108.2	3.690	2.737	1.292	0.807	0.587
108.3	3.694	2.739	1.293	0.808	0.588
108.4	3.697	2.742	1.294	0.809	0.588
108.5	3.701	2.744	1.295	0.809	0.589
108.6	3.704	2.747	1.296	0.810	0.589
108.7	3.707	2.749	1.298	0.811	0.590
108.8	3.711	2.752	1.299	0.812	0.590
108.9	3.714	2.754	1.300	0.812	0.591
109.0	3.718	2.757	1.301	0.813	0.591
109.1	3.721	2.759	1.302	0.814	0.592
109.2	3.724	2.762	1.303	0.815	0.592
109.3	3.728	2.764	1.305	0.815	0.593
109.4	3.731	2.767	1.306	0.816	0.594
109.5	3.735	2.769	1.307	0.817	0.594
109.6	3.738	2.772	1.308	0.818	0.595
109.7	3.741	2.774	1.309	0.818	0.595
109.8	3.745	2.777	1.311	0.819	0.596
109.9	3.748	2.780	1.312	0.820	0.596

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
110.0	3.752	2.782	1.313	0.821	0.597
110.1	3.755	2.785	1.314	0.821	0.597
110.2	3.758	2.787	1.315	0.822	0.598
110.3	3.762	2.790	1.317	0.823	0.598
110.4	3.765	2.792	1.318	0.824	0.599
110.5	3.769	2.795	1.319	0.824	0.600
110.6	3.772	2.797	1.320	0.825	0.600
110.7	3.776	2.800	1.321	0.826	0.601
110.8	3.779	2.802	1.323	0.827	0.601
110.9	3.782	2.805	1.324	0.827	0.602
111.0	3.786	2.807	1.325	0.828	0.602
111.1	3.789	2.810	1.326	0.829	0.603
111.2	3.793	2.812	1.327	0.830	0.603
111.3	3.796	2.815	1.329	0.830	0.604
111.4	3.799	2.817	1.330	0.831	0.604
111.5	3.803	2.820	1.331	0.832	0.605
111.6	3.806	2.823	1.332	0.833	0.606
111.7	3.810	2.825	1.333	0.833	0.606
111.8	3.813	2.828	1.335	0.834	0.607
111.9	3.816	2.830	1.336	0.835	0.607
112.0	3.820	2.833	1.337	0.836	0.608
112.1	3.823	2.835	1.338	0.836	0.608
112.2	3.827	2.838	1.339	0.837	0.609
112.3	3.830	2.840	1.340	0.838	0.609
112.4	3.834	2.843	1.342	0.839	0.610
112.5	3.837	2.845	1.343	0.839	0.610
112.6	3.840	2.848	1.344	0.840	0.611
112.7	3.844	2.850	1.345	0.841	0.611
112.8	3.847	2.853	1.346	0.842	0.612
112.9	3.851	2.855	1.348	0.842	0.613
113.0	3.854	2.858	1.349	0.843	0.613
113.1	3.857	2.860	1.350	0.844	0.614
113.2	3.861	2.863	1.351	0.845	0.614
113.3	3.864	2.866	1.352	0.845	0.615
113.4	3.868	2.868	1.354	0.846	0.615
113.5	3.871	2.871	1.355	0.847	0.616
113.6	3.874	2.873	1.356	0.848	0.616
113.7	3.878	2.876	1.357	0.848	0.617
113.8	3.881	2.878	1.358	0.849	0.617
113.9	3.885	2.881	1.360	0.850	0.618
114.0	3.888	2.883	1.361	0.850	0.619
114.1	3.891	2.886	1.362	0.851	0.619
114.2	3.895	2.888	1.363	0.852	0.620
114.3	3.898	2.891	1.364	0.853	0.620
114.4	3.902	2.893	1.366	0.853	0.621
114.5	3.905	2.896	1.367	0.854	0.621
114.6	3.909	2.898	1.368	0.855	0.622
114.7	3.912	2.901	1.369	0.856	0.622
114.8	3.915	2.903	1.370	0.856	0.623
114.9	3.919	2.906	1.372	0.857	0.623

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
115.0	3.922	2.909	1.373	0.858	0.624
115.1	3.926	2.911	1.374	0.859	0.625
115.2	3.929	2.914	1.375	0.859	0.625
115.3	3.932	2.916	1.376	0.860	0.626
115.4	3.936	2.919	1.377	0.861	0.626
115.5	3.939	2.921	1.379	0.862	0.627
115.6	3.943	2.924	1.380	0.862	0.627
115.7	3.946	2.926	1.381	0.863	0.628
115.8	3.949	2.929	1.382	0.864	0.628
115.9	3.953	2.931	1.383	0.865	0.629
116.0	3.956	2.934	1.385	0.865	0.629
116.1	3.960	2.936	1.386	0.866	0.630
116.2	3.963	2.939	1.387	0.867	0.630
116.3	3.967	2.941	1.388	0.868	0.631
116.4	3.970	2.944	1.389	0.868	0.632
116.5	3.973	2.946	1.391	0.869	0.632
116.6	3.977	2.949	1.392	0.870	0.633
116.7	3.980	2.951	1.393	0.871	0.633
116.8	3.984	2.954	1.394	0.871	0.634
116.9	3.987	2.957	1.395	0.872	0.634
117.0	3.990	2.959	1.397	0.873	0.635
117.1	3.994	2.962	1.398	0.874	0.635
117.2	3.997	2.964	1.399	0.874	0.636
117.3	4.001	2.967	1.400	0.875	0.636
117.4	4.004	2.969	1.401	0.876	0.637
117.5	4.007	2.972	1.403	0.877	0.638
117.6	4.011	2.974	1.404	0.877	0.638
117.7	4.014	2.977	1.405	0.878	0.639
117.8	4.018	2.979	1.406	0.879	0.639
117.9	4.021	2.982	1.407	0.880	0.640
118.0	4.025	2.984	1.409	0.880	0.640
118.1	4.028	2.987	1.410	0.881	0.641
118.2	4.031	2.989	1.411	0.882	0.641
118.3	4.035	2.992	1.412	0.883	0.642
118.4	4.038	2.994	1.413	0.883	0.642
118.5	4.042	2.997	1.414	0.884	0.643
118.6	4.045	3.000	1.416	0.885	0.643
118.7	4.048	3.002	1.417	0.886	0.644
118.8	4.052	3.005	1.418	0.886	0.645
118.9	4.055	3.007	1.419	0.887	0.645
119.0	4.059	3.010	1.420	0.888	0.646
119.1	4.062	3.012	1.422	0.889	0.646
119.2	4.065	3.015	1.423	0.889	0.647
119.3	4.069	3.017	1.424	0.890	0.647
119.4	4.072	3.020	1.425	0.891	0.648
119.5	4.076	3.022	1.426	0.892	0.648
119.6	4.079	3.025	1.428	0.892	0.649
119.7	4.082	3.027	1.429	0.893	0.649
119.8	4.086	3.030	1.430	0.894	0.650
119.9	4.089	3.032	1.431	0.895	0.651

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
120.0	4.093	3.035	1.432	0.895	0.651
120.1	4.096	3.037	1.434	0.896	0.652
120.2	4.100	3.040	1.435	0.897	0.652
120.3	4.103	3.043	1.436	0.897	0.653
120.4	4.106	3.045	1.437	0.898	0.653
120.5	4.110	3.048	1.438	0.899	0.654
120.6	4.113	3.050	1.440	0.900	0.654
120.7	4.117	3.053	1.441	0.900	0.655
120.8	4.120	3.055	1.442	0.901	0.655
120.9	4.123	3.058	1.443	0.902	0.656
121.0	4.127	3.060	1.444	0.903	0.657
121.1	4.130	3.063	1.446	0.903	0.657
121.2	4.134	3.065	1.447	0.904	0.658
121.3	4.137	3.068	1.448	0.905	0.658
121.4	4.140	3.070	1.449	0.906	0.659
121.5	4.144	3.073	1.450	0.906	0.659
121.6	4.147	3.075	1.452	0.907	0.660
121.7	4.151	3.078	1.453	0.908	0.660
121.8	4.154	3.080	1.454	0.909	0.661
121.9	4.158	3.083	1.455	0.909	0.661
122.0	4.161	3.086	1.456	0.910	0.662
122.1	4.164	3.088	1.457	0.911	0.662
122.2	4.168	3.091	1.459	0.912	0.663
122.3	4.171	3.093	1.460	0.912	0.664
122.4	4.175	3.096	1.461	0.913	0.664
122.5	4.178	3.098	1.462	0.914	0.665
122.6	4.181	3.101	1.463	0.915	0.665
122.7	4.185	3.103	1.465	0.915	0.666
122.8	4.188	3.106	1.466	0.916	0.666
122.9	4.192	3.108	1.467	0.917	0.667
123.0	4.195	3.111	1.468	0.918	0.667
123.1	4.198	3.113	1.469	0.918	0.668
123.2	4.202	3.116	1.471	0.919	0.668
123.3	4.205	3.118	1.472	0.920	0.669
123.4	4.209	3.121	1.473	0.921	0.670
123.5	4.212	3.123	1.474	0.921	0.670
123.6	4.216	3.126	1.475	0.922	0.671
123.7	4.219	3.129	1.477	0.923	0.671
123.8	4.222	3.131	1.478	0.924	0.672
123.9	4.226	3.134	1.479	0.924	0.672
124.0	4.229	3.136	1.480	0.925	0.673
124.1	4.233	3.139	1.481	0.926	0.673
124.2	4.236	3.141	1.483	0.927	0.674
124.3	4.239	3.144	1.484	0.927	0.674
124.4	4.243	3.146	1.485	0.928	0.675
124.5	4.246	3.149	1.486	0.929	0.676
124.6	4.250	3.151	1.487	0.930	0.676
124.7	4.253	3.154	1.489	0.930	0.677
124.8	4.256	3.156	1.490	0.931	0.677
124.9	4.260	3.159	1.491	0.932	0.678

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
125.0	4.263	3.161	1.492	0.933	0.678
125.1	4.267	3.164	1.493	0.933	0.679
125.2	4.270	3.166	1.494	0.934	0.679
125.3	4.273	3.169	1.496	0.935	0.680
125.4	4.277	3.172	1.497	0.936	0.680
125.5	4.280	3.174	1.498	0.936	0.681
125.6	4.284	3.177	1.499	0.937	0.681
125.7	4.287	3.179	1.500	0.938	0.682
125.8	4.291	3.182	1.502	0.939	0.683
125.9	4.294	3.184	1.503	0.939	0.683
126.0	4.297	3.187	1.504	0.940	0.684
126.1	4.301	3.189	1.505	0.941	0.684
126.2	4.304	3.192	1.506	0.942	0.685
126.3	4.308	3.194	1.508	0.942	0.685
126.4	4.311	3.197	1.509	0.943	0.686
126.5	4.314	3.199	1.510	0.944	0.686
126.6	4.318	3.202	1.511	0.944	0.687
126.7	4.321	3.204	1.512	0.945	0.687
126.8	4.325	3.207	1.514	0.946	0.688
126.9	4.328	3.209	1.515	0.947	0.689
127.0	4.331	3.212	1.516	0.947	0.689
127.1	4.335	3.215	1.517	0.948	0.690
127.2	4.338	3.217	1.518	0.949	0.690
127.3	4.342	3.220	1.520	0.950	0.691
127.4	4.345	3.222	1.521	0.950	0.691
127.5	4.349	3.225	1.522	0.951	0.692
127.6	4.352	3.227	1.523	0.952	0.692
127.7	4.355	3.230	1.524	0.953	0.693
127.8	4.359	3.232	1.526	0.953	0.693
127.9	4.362	3.235	1.527	0.954	0.694
128.0	4.366	3.237	1.528	0.955	0.694
128.1	4.369	3.240	1.529	0.956	0.695
128.2	4.372	3.242	1.530	0.956	0.696
128.3	4.376	3.245	1.531	0.957	0.696
128.4	4.379	3.247	1.533	0.958	0.697
128.5	4.383	3.250	1.534	0.959	0.697
128.6	4.386	3.252	1.535	0.959	0.698
128.7	4.389	3.255	1.536	0.960	0.698
128.8	4.393	3.258	1.537	0.961	0.699
128.9	4.396	3.260	1.539	0.962	0.699
129.0	4.400	3.263	1.540	0.962	0.700
129.1	4.403	3.265	1.541	0.963	0.700
129.2	4.406	3.268	1.542	0.964	0.701
129.3	4.410	3.270	1.543	0.965	0.702
129.4	4.413	3.273	1.545	0.965	0.702
129.5	4.417	3.275	1.546	0.966	0.703
129.6	4.420	3.278	1.547	0.967	0.703
129.7	4.424	3.280	1.548	0.968	0.704
129.8	4.427	3.283	1.549	0.968	0.704
129.9	4.430	3.285	1.551	0.969	0.705

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
130.0	4.434	3.288	1.552	0.970	0.705
130.1	4.437	3.290	1.553	0.971	0.706
130.2	4.441	3.293	1.554	0.971	0.706
130.3	4.444	3.295	1.555	0.972	0.707
130.4	4.447	3.298	1.557	0.973	0.708
130.5	4.451	3.301	1.558	0.974	0.708
130.6	4.454	3.303	1.559	0.974	0.709
130.7	4.458	3.306	1.560	0.975	0.709
130.8	4.461	3.308	1.561	0.976	0.710
130.9	4.464	3.311	1.563	0.977	0.710
131.0	4.468	3.313	1.564	0.977	0.711
131.1	4.471	3.316	1.565	0.978	0.711
131.2	4.475	3.318	1.566	0.979	0.712
131.3	4.478	3.321	1.567	0.980	0.712
131.4	4.482	3.323	1.568	0.980	0.713
131.5	4.485	3.326	1.570	0.981	0.713
131.6	4.488	3.328	1.571	0.982	0.714
131.7	4.492	3.331	1.572	0.983	0.715
131.8	4.495	3.333	1.573	0.983	0.715
131.9	4.499	3.336	1.574	0.984	0.716
132.0	4.502	3.338	1.576	0.985	0.716
132.1	4.505	3.341	1.577	0.986	0.717
132.2	4.509	3.344	1.578	0.986	0.717
132.3	4.512	3.346	1.579	0.987	0.718
132.4	4.516	3.349	1.580	0.988	0.718
132.5	4.519	3.351	1.582	0.989	0.719
132.6	4.522	3.354	1.583	0.989	0.719
132.7	4.526	3.356	1.584	0.990	0.720
132.8	4.529	3.359	1.585	0.991	0.721
132.9	4.533	3.361	1.586	0.991	0.721
133.0	4.536	3.364	1.588	0.992	0.722
133.1	4.540	3.366	1.589	0.993	0.722
133.2	4.543	3.369	1.590	0.994	0.723
133.3	4.546	3.371	1.591	0.994	0.723
133.4	4.550	3.374	1.592	0.995	0.724
133.5	4.553	3.376	1.594	0.996	0.724
133.6	4.557	3.379	1.595	0.997	0.725
133.7	4.560	3.381	1.596	0.997	0.725
133.8	4.563	3.384	1.597	0.998	0.726
133.9	4.567	3.387	1.598	0.999	0.727
134.0	4.570	3.389	1.600	1.000	0.727
134.1	4.574	3.392	1.601	1.000	0.728
134.2	4.577	3.394	1.602	1.001	0.728
134.3	4.580	3.397	1.603	1.002	0.729
134.4	4.584	3.399	1.604	1.003	0.729
134.5	4.587	3.402	1.605	1.003	0.730
134.6	4.591	3.404	1.607	1.004	0.730
134.7	4.594	3.407	1.608	1.005	0.731
134.8	4.597	3.409	1.609	1.006	0.731
134.9	4.601	3.412	1.610	1.006	0.732

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
135.0	4.604	3.414	1.611	1.007	0.732
135.1	4.608	3.417	1.613	1.008	0.733
135.2	4.611	3.419	1.614	1.009	0.734
135.3	4.615	3.422	1.615	1.009	0.734
135.4	4.618	3.424	1.616	1.010	0.735
135.5	4.621	3.427	1.617	1.011	0.735
135.6	4.625	3.430	1.619	1.012	0.736
135.7	4.628	3.432	1.620	1.012	0.736
135.8	4.632	3.435	1.621	1.013	0.737
135.9	4.635	3.437	1.622	1.014	0.737
136.0	4.638	3.440	1.623	1.015	0.738
136.1	4.642	3.442	1.625	1.015	0.738
136.2	4.645	3.445	1.626	1.016	0.739
136.3	4.649	3.447	1.627	1.017	0.740
136.4	4.652	3.450	1.628	1.018	0.740
136.5	4.655	3.452	1.629	1.018	0.741
136.6	4.659	3.455	1.631	1.019	0.741
136.7	4.662	3.457	1.632	1.020	0.742
136.8	4.666	3.460	1.633	1.021	0.742
136.9	4.669	3.462	1.634	1.021	0.743
137.0	4.673	3.465	1.635	1.022	0.743
137.1	4.676	3.467	1.637	1.023	0.744
137.2	4.679	3.470	1.638	1.024	0.744
137.3	4.683	3.473	1.639	1.024	0.745
137.4	4.686	3.475	1.640	1.025	0.745
137.5	4.690	3.478	1.641	1.026	0.746
137.6	4.693	3.480	1.642	1.027	0.747
137.7	4.696	3.483	1.644	1.027	0.747
137.8	4.700	3.485	1.645	1.028	0.748
137.9	4.703	3.488	1.646	1.029	0.748
138.0	4.707	3.490	1.647	1.030	0.749
138.1	4.710	3.493	1.648	1.030	0.749
138.2	4.713	3.495	1.650	1.031	0.750
138.3	4.717	3.498	1.651	1.032	0.750
138.4	4.720	3.500	1.652	1.033	0.751
138.5	4.724	3.503	1.653	1.033	0.751
138.6	4.727	3.505	1.654	1.034	0.752
138.7	4.731	3.508	1.656	1.035	0.753
138.8	4.734	3.510	1.657	1.036	0.753
138.9	4.737	3.513	1.658	1.036	0.754
139.0	4.741	3.515	1.659	1.037	0.754
139.1	4.744	3.518	1.660	1.038	0.755
139.2	4.748	3.521	1.662	1.038	0.755
139.3	4.751	3.523	1.663	1.039	0.756
139.4	4.754	3.526	1.664	1.040	0.756
139.5	4.758	3.528	1.665	1.041	0.757
139.6	4.761	3.531	1.666	1.041	0.757
139.7	4.765	3.533	1.668	1.042	0.758
139.8	4.768	3.536	1.669	1.043	0.759
139.9	4.771	3.538	1.670	1.044	0.759

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
140.0	4.775	3.541	1.671	1.044	0.760
140.1	4.778	3.543	1.672	1.045	0.760
140.2	4.782	3.546	1.674	1.046	0.761
140.3	4.785	3.548	1.675	1.047	0.761
140.4	4.788	3.551	1.676	1.047	0.762
140.5	4.792	3.553	1.677	1.048	0.762
140.6	4.795	3.556	1.678	1.049	0.763
140.7	4.799	3.558	1.679	1.050	0.763
140.8	4.802	3.561	1.681	1.050	0.764
140.9	4.806	3.564	1.682	1.051	0.764
141.0	4.809	3.566	1.683	1.052	0.765
141.1	4.812	3.569	1.684	1.053	0.766
141.2	4.816	3.571	1.685	1.053	0.766
141.3	4.819	3.574	1.687	1.054	0.767
141.4	4.823	3.576	1.688	1.055	0.767
141.5	4.826	3.579	1.689	1.056	0.768
141.6	4.829	3.581	1.690	1.056	0.768
141.7	4.833	3.584	1.691	1.057	0.769
141.8	4.836	3.586	1.693	1.058	0.769
141.9	4.840	3.589	1.694	1.059	0.770
142.0	4.843	3.591	1.695	1.059	0.770
142.1	4.846	3.594	1.696	1.060	0.771
142.2	4.850	3.596	1.697	1.061	0.772
142.3	4.853	3.599	1.699	1.062	0.772
142.4	4.857	3.601	1.700	1.062	0.773
142.5	4.860	3.604	1.701	1.063	0.773
142.6	4.864	3.607	1.702	1.064	0.774
142.7	4.867	3.609	1.703	1.065	0.774
142.8	4.870	3.612	1.705	1.065	0.775
142.9	4.874	3.614	1.706	1.066	0.775
143.0	4.877	3.617	1.707	1.067	0.776
143.1	4.881	3.619	1.708	1.068	0.776
143.2	4.884	3.622	1.709	1.068	0.777
143.3	4.887	3.624	1.711	1.069	0.778
143.4	4.891	3.627	1.712	1.070	0.778
143.5	4.894	3.629	1.713	1.071	0.779
143.6	4.898	3.632	1.714	1.071	0.779
143.7	4.901	3.634	1.715	1.072	0.780
143.8	4.904	3.637	1.716	1.073	0.780
143.9	4.908	3.639	1.718	1.074	0.781
144.0	4.911	3.642	1.719	1.074	0.781
144.1	4.915	3.644	1.720	1.075	0.782
144.2	4.918	3.647	1.721	1.076	0.782
144.3	4.922	3.650	1.722	1.077	0.783
144.4	4.925	3.652	1.724	1.077	0.783
144.5	4.928	3.655	1.725	1.078	0.784
144.6	4.932	3.657	1.726	1.079	0.785
144.7	4.935	3.660	1.727	1.080	0.785
144.8	4.939	3.662	1.728	1.080	0.786
144.9	4.942	3.665	1.730	1.081	0.786

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
145.0	4.945	3.667	1.731	1.082	0.787
145.1	4.949	3.670	1.732	1.083	0.787
145.2	4.952	3.672	1.733	1.083	0.788
145.3	4.956	3.675	1.734	1.084	0.788
145.4	4.959	3.677	1.736	1.085	0.789
145.5	4.962	3.680	1.737	1.085	0.789
145.6	4.966	3.682	1.738	1.086	0.790
145.7	4.969	3.685	1.739	1.087	0.791
145.8	4.973	3.687	1.740	1.088	0.791
145.9	4.976	3.690	1.742	1.088	0.792
146.0	4.979	3.693	1.743	1.089	0.792
146.1	4.983	3.695	1.744	1.090	0.793
146.2	4.986	3.698	1.745	1.091	0.793
146.3	4.990	3.700	1.746	1.091	0.794
146.4	4.993	3.703	1.748	1.092	0.794
146.5	4.997	3.705	1.749	1.093	0.795
146.6	5.000	3.708	1.750	1.094	0.795
146.7	5.003	3.710	1.751	1.094	0.796
146.8	5.007	3.713	1.752	1.095	0.797
146.9	5.010	3.715	1.753	1.096	0.797
147.0	5.014	3.718	1.755	1.097	0.798
147.1	5.017	3.720	1.756	1.097	0.798
147.2	5.020	3.723	1.757	1.098	0.799
147.3	5.024	3.725	1.758	1.099	0.799
147.4	5.027	3.728	1.759	1.100	0.800
147.5	5.031	3.730	1.761	1.100	0.800
147.6	5.034	3.733	1.762	1.101	0.801
147.7	5.037	3.736	1.763	1.102	0.801
147.8	5.041	3.738	1.764	1.103	0.802
147.9	5.044	3.741	1.765	1.103	0.802
148.0	5.048	3.743	1.767	1.104	0.803
148.1	5.051	3.746	1.768	1.105	0.804
148.2	5.055	3.748	1.769	1.106	0.804
148.3	5.058	3.751	1.770	1.106	0.805
148.4	5.061	3.753	1.771	1.107	0.805
148.5	5.065	3.756	1.773	1.108	0.806
148.6	5.068	3.758	1.774	1.109	0.806
148.7	5.072	3.761	1.775	1.109	0.807
148.8	5.075	3.763	1.776	1.110	0.807
148.9	5.078	3.766	1.777	1.111	0.808
149.0	5.082	3.768	1.779	1.112	0.808
149.1	5.085	3.771	1.780	1.112	0.809
149.2	5.089	3.773	1.781	1.113	0.810
149.3	5.092	3.776	1.782	1.114	0.810
149.4	5.095	3.779	1.783	1.115	0.811
149.5	5.099	3.781	1.785	1.115	0.811
149.6	5.102	3.784	1.786	1.116	0.812
149.7	5.106	3.786	1.787	1.117	0.812
149.8	5.109	3.789	1.788	1.118	0.813
149.9	5.112	3.791	1.789	1.118	0.813

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
150.0	5.116	3.794	1.791	1.119	0.814
150.1	5.119	3.796	1.792	1.120	0.814
150.2	5.123	3.799	1.793	1.121	0.815
150.3	5.126	3.801	1.794	1.121	0.815
150.4	5.130	3.804	1.795	1.122	0.816
150.5	5.133	3.806	1.796	1.123	0.817
150.6	5.136	3.809	1.798	1.124	0.817
150.7	5.140	3.811	1.799	1.124	0.818
150.8	5.143	3.814	1.800	1.125	0.818
150.9	5.147	3.816	1.801	1.126	0.819
151.0	5.150	3.819	1.802	1.127	0.819
151.1	5.153	3.822	1.804	1.127	0.820
151.2	5.157	3.824	1.805	1.128	0.820
151.3	5.160	3.827	1.806	1.129	0.821
151.4	5.164	3.829	1.807	1.130	0.821
151.5	5.167	3.832	1.808	1.130	0.822
151.6	5.170	3.834	1.810	1.131	0.823
151.7	5.174	3.837	1.811	1.132	0.823
151.8	5.177	3.839	1.812	1.132	0.824
151.9	5.181	3.842	1.813	1.133	0.824
152.0	5.184	3.844	1.814	1.134	0.825
152.1	5.188	3.847	1.816	1.135	0.825
152.2	5.191	3.849	1.817	1.135	0.826
152.3	5.194	3.852	1.818	1.136	0.826
152.4	5.198	3.854	1.819	1.137	0.827
152.5	5.201	3.857	1.820	1.138	0.827
152.6	5.205	3.859	1.822	1.138	0.828
152.7	5.208	3.862	1.823	1.139	0.829
152.8	5.211	3.865	1.824	1.140	0.829
152.9	5.215	3.867	1.825	1.141	0.830
153.0	5.218	3.870	1.826	1.141	0.830
153.1	5.222	3.872	1.828	1.142	0.831
153.2	5.225	3.875	1.829	1.143	0.831
153.3	5.228	3.877	1.830	1.144	0.832
153.4	5.232	3.880	1.831	1.144	0.832
153.5	5.235	3.882	1.832	1.145	0.833
153.6	5.239	3.885	1.833	1.146	0.833
153.7	5.242	3.887	1.835	1.147	0.834
153.8	5.246	3.890	1.836	1.147	0.834
153.9	5.249	3.892	1.837	1.148	0.835
154.0	5.252	3.895	1.838	1.149	0.836
154.1	5.256	3.897	1.839	1.150	0.836
154.2	5.259	3.900	1.841	1.150	0.837
154.3	5.263	3.902	1.842	1.151	0.837
154.4	5.266	3.905	1.843	1.152	0.838
154.5	5.269	3.908	1.844	1.153	0.838
154.6	5.273	3.910	1.845	1.153	0.839
154.7	5.276	3.913	1.847	1.154	0.839
154.8	5.280	3.915	1.848	1.155	0.840
154.9	5.283	3.918	1.849	1.156	0.840

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
155.0	5.286	3.920	1.850	1.156	0.841
155.1	5.290	3.923	1.851	1.157	0.842
155.2	5.293	3.925	1.853	1.158	0.842
155.3	5.297	3.928	1.854	1.159	0.843
155.4	5.300	3.930	1.855	1.159	0.843
155.5	5.303	3.933	1.856	1.160	0.844
155.6	5.307	3.935	1.857	1.161	0.844
155.7	5.310	3.938	1.859	1.162	0.845
155.8	5.314	3.940	1.860	1.162	0.845
155.9	5.317	3.943	1.861	1.163	0.846
156.0	5.321	3.945	1.862	1.164	0.846
156.1	5.324	3.948	1.863	1.165	0.847
156.2	5.327	3.951	1.865	1.165	0.848
156.3	5.331	3.953	1.866	1.166	0.848
156.4	5.334	3.956	1.867	1.167	0.849
156.5	5.338	3.958	1.868	1.168	0.849
156.6	5.341	3.961	1.869	1.168	0.850
156.7	5.344	3.963	1.870	1.169	0.850
156.8	5.348	3.966	1.872	1.170	0.851
156.9	5.351	3.968	1.873	1.171	0.851
157.0	5.355	3.971	1.874	1.171	0.852
157.1	5.358	3.973	1.875	1.172	0.852
157.2	5.361	3.976	1.876	1.173	0.853
157.3	5.365	3.978	1.878	1.174	0.853
157.4	5.368	3.981	1.879	1.174	0.854
157.5	5.372	3.983	1.880	1.175	0.855
157.6	5.375	3.986	1.881	1.176	0.855
157.7	5.379	3.988	1.882	1.177	0.856
157.8	5.382	3.991	1.884	1.177	0.856
157.9	5.385	3.994	1.885	1.178	0.857
158.0	5.389	3.996	1.886	1.179	0.857
158.1	5.392	3.999	1.887	1.179	0.858
158.2	5.396	4.001	1.888	1.180	0.858
158.3	5.399	4.004	1.890	1.181	0.859
158.4	5.402	4.006	1.891	1.182	0.859
158.5	5.406	4.009	1.892	1.182	0.860
158.6	5.409	4.011	1.893	1.183	0.861
158.7	5.413	4.014	1.894	1.184	0.861
158.8	5.416	4.016	1.896	1.185	0.862
158.9	5.419	4.019	1.897	1.185	0.862
159.0	5.423	4.021	1.898	1.186	0.863
159.1	5.426	4.024	1.899	1.187	0.863
159.2	5.430	4.026	1.900	1.188	0.864
159.3	5.433	4.029	1.902	1.188	0.864
159.4	5.437	4.031	1.903	1.189	0.865
159.5	5.440	4.034	1.904	1.190	0.865
159.6	5.443	4.036	1.905	1.191	0.866
159.7	5.447	4.039	1.906	1.191	0.866
159.8	5.450	4.042	1.907	1.192	0.867
159.9	5.454	4.044	1.909	1.193	0.868

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
160.0	5.457	4.047	1.910	1.194	0.868
160.1	5.460	4.049	1.911	1.194	0.869
160.2	5.464	4.052	1.912	1.195	0.869
160.3	5.467	4.054	1.913	1.196	0.870
160.4	5.471	4.057	1.915	1.197	0.870
160.5	5.474	4.059	1.916	1.197	0.871
160.6	5.477	4.062	1.917	1.198	0.871
160.7	5.481	4.064	1.918	1.199	0.872
160.8	5.484	4.067	1.919	1.200	0.872
160.9	5.488	4.069	1.921	1.200	0.873
161.0	5.491	4.072	1.922	1.201	0.874
161.1	5.494	4.074	1.923	1.202	0.874
161.2	5.498	4.077	1.924	1.203	0.875
161.3	5.501	4.079	1.925	1.203	0.875
161.4	5.505	4.082	1.927	1.204	0.876
161.5	5.508	4.085	1.928	1.205	0.876
161.6	5.512	4.087	1.929	1.206	0.877
161.7	5.515	4.090	1.930	1.206	0.877
161.8	5.518	4.092	1.931	1.207	0.878
161.9	5.522	4.095	1.933	1.208	0.878
162.0	5.525	4.097	1.934	1.209	0.879
162.1	5.529	4.100	1.935	1.209	0.880
162.2	5.532	4.102	1.936	1.210	0.880
162.3	5.535	4.105	1.937	1.211	0.881
162.4	5.539	4.107	1.939	1.212	0.881
162.5	5.542	4.110	1.940	1.212	0.882
162.6	5.546	4.112	1.941	1.213	0.882
162.7	5.549	4.115	1.942	1.214	0.883
162.8	5.552	4.117	1.943	1.215	0.883
162.9	5.556	4.120	1.944	1.215	0.884
163.0	5.559	4.122	1.946	1.216	0.884
163.1	5.563	4.125	1.947	1.217	0.885
163.2	5.566	4.128	1.948	1.218	0.885
163.3	5.570	4.130	1.949	1.218	0.886
163.4	5.573	4.133	1.950	1.219	0.887
163.5	5.576	4.135	1.952	1.220	0.887
163.6	5.580	4.138	1.953	1.221	0.888
163.7	5.583	4.140	1.954	1.221	0.888
163.8	5.587	4.143	1.955	1.222	0.889
163.9	5.590	4.145	1.956	1.223	0.889
164.0	5.593	4.148	1.958	1.224	0.890
164.1	5.597	4.150	1.959	1.224	0.890
164.2	5.600	4.153	1.960	1.225	0.891
164.3	5.604	4.155	1.961	1.226	0.891
164.4	5.607	4.158	1.962	1.226	0.892
164.5	5.610	4.160	1.964	1.227	0.893
164.6	5.614	4.163	1.965	1.228	0.893
164.7	5.617	4.165	1.966	1.229	0.894
164.8	5.621	4.168	1.967	1.229	0.894
164.9	5.624	4.171	1.968	1.230	0.895

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
165.0	5.627	4.173	1.970	1.231	0.895
165.1	5.631	4.176	1.971	1.232	0.896
165.2	5.634	4.178	1.972	1.232	0.896
165.3	5.638	4.181	1.973	1.233	0.897
165.4	5.641	4.183	1.974	1.234	0.897
165.5	5.645	4.186	1.976	1.235	0.898
165.6	5.648	4.188	1.977	1.235	0.899
165.7	5.651	4.191	1.978	1.236	0.899
165.8	5.655	4.193	1.979	1.237	0.900
165.9	5.658	4.196	1.980	1.238	0.900
166.0	5.662	4.198	1.981	1.238	0.901
166.1	5.665	4.201	1.983	1.239	0.901
166.2	5.668	4.203	1.984	1.240	0.902
166.3	5.672	4.206	1.985	1.241	0.902
166.4	5.675	4.208	1.986	1.241	0.903
166.5	5.679	4.211	1.987	1.242	0.903
166.6	5.682	4.214	1.989	1.243	0.904
166.7	5.685	4.216	1.990	1.244	0.904
166.8	5.689	4.219	1.991	1.244	0.905
166.9	5.692	4.221	1.992	1.245	0.906
167.0	5.696	4.224	1.993	1.246	0.906
167.1	5.699	4.226	1.995	1.247	0.907
167.2	5.703	4.229	1.996	1.247	0.907
167.3	5.706	4.231	1.997	1.248	0.908
167.4	5.709	4.234	1.998	1.249	0.908
167.5	5.713	4.236	1.999	1.250	0.909
167.6	5.716	4.239	2.001	1.250	0.909
167.7	5.720	4.241	2.002	1.251	0.910
167.8	5.723	4.244	2.003	1.252	0.910
167.9	5.726	4.246	2.004	1.253	0.911
168.0	5.730	4.249	2.005	1.253	0.912
168.1	5.733	4.251	2.007	1.254	0.912
168.2	5.737	4.254	2.008	1.255	0.913
168.3	5.740	4.257	2.009	1.256	0.913
168.4	5.743	4.259	2.010	1.256	0.914
168.5	5.747	4.262	2.011	1.257	0.914
168.6	5.750	4.264	2.013	1.258	0.915
168.7	5.754	4.267	2.014	1.259	0.915
168.8	5.757	4.269	2.015	1.259	0.916
168.9	5.761	4.272	2.016	1.260	0.916
169.0	5.764	4.274	2.017	1.261	0.917
169.1	5.767	4.277	2.018	1.262	0.917
169.2	5.771	4.279	2.020	1.262	0.918
169.3	5.774	4.282	2.021	1.263	0.919
169.4	5.778	4.284	2.022	1.264	0.919
169.5	5.781	4.287	2.023	1.265	0.920
169.6	5.784	4.289	2.024	1.265	0.920
169.7	5.788	4.292	2.026	1.266	0.921
169.8	5.791	4.294	2.027	1.267	0.921
169.9	5.795	4.297	2.028	1.268	0.922

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
170.0	5.798	4.300	2.029	1.268	0.922
170.1	5.801	4.302	2.030	1.269	0.923
170.2	5.805	4.305	2.032	1.270	0.923
170.3	5.808	4.307	2.033	1.271	0.924
170.4	5.812	4.310	2.034	1.271	0.925
170.5	5.815	4.312	2.035	1.272	0.925
170.6	5.818	4.315	2.036	1.273	0.926
170.7	5.822	4.317	2.038	1.273	0.926
170.8	5.825	4.320	2.039	1.274	0.927
170.9	5.829	4.322	2.040	1.275	0.927
171.0	5.832	4.325	2.041	1.276	0.928
171.1	5.836	4.327	2.042	1.276	0.928
171.2	5.839	4.330	2.044	1.277	0.929
171.3	5.842	4.332	2.045	1.278	0.929
171.4	5.846	4.335	2.046	1.279	0.930
171.5	5.849	4.337	2.047	1.279	0.931
171.6	5.853	4.340	2.048	1.280	0.931
171.7	5.856	4.343	2.050	1.281	0.932
171.8	5.859	4.345	2.051	1.282	0.932
171.9	5.863	4.348	2.052	1.282	0.933
172.0	5.866	4.350	2.053	1.283	0.933
172.1	5.870	4.353	2.054	1.284	0.934
172.2	5.873	4.355	2.055	1.285	0.934
172.3	5.876	4.358	2.057	1.285	0.935
172.4	5.880	4.360	2.058	1.286	0.935
172.5	5.883	4.363	2.059	1.287	0.936
172.6	5.887	4.365	2.060	1.288	0.936
172.7	5.890	4.368	2.061	1.288	0.937
172.8	5.894	4.370	2.063	1.289	0.938
172.9	5.897	4.373	2.064	1.290	0.938
173.0	5.900	4.375	2.065	1.291	0.939
173.1	5.904	4.378	2.066	1.291	0.939
173.2	5.907	4.380	2.067	1.292	0.940
173.3	5.911	4.383	2.069	1.293	0.940
173.4	5.914	4.386	2.070	1.294	0.941
173.5	5.917	4.388	2.071	1.294	0.941
173.6	5.921	4.391	2.072	1.295	0.942
173.7	5.924	4.393	2.073	1.296	0.942
173.8	5.928	4.396	2.075	1.297	0.943
173.9	5.931	4.398	2.076	1.297	0.944
174.0	5.934	4.401	2.077	1.298	0.944
174.1	5.938	4.403	2.078	1.299	0.945
174.2	5.941	4.406	2.079	1.300	0.945
174.3	5.945	4.408	2.081	1.300	0.946
174.4	5.948	4.411	2.082	1.301	0.946
174.5	5.952	4.413	2.083	1.302	0.947
174.6	5.955	4.416	2.084	1.303	0.947
174.7	5.958	4.418	2.085	1.303	0.948
174.8	5.962	4.421	2.087	1.304	0.948
174.9	5.965	4.423	2.088	1.305	0.949

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
175.0	5.969	4.426	2.089	1.306	0.950
175.1	5.972	4.429	2.090	1.306	0.950
175.2	5.975	4.431	2.091	1.307	0.951
175.3	5.979	4.434	2.093	1.308	0.951
175.4	5.982	4.436	2.094	1.309	0.952
175.5	5.986	4.439	2.095	1.309	0.952
175.6	5.989	4.441	2.096	1.310	0.953
175.7	5.992	4.444	2.097	1.311	0.953
175.8	5.996	4.446	2.098	1.312	0.954
175.9	5.999	4.449	2.100	1.312	0.954
176.0	6.003	4.451	2.101	1.313	0.955
176.1	6.006	4.454	2.102	1.314	0.955
176.2	6.009	4.456	2.103	1.315	0.956
176.3	6.013	4.459	2.104	1.315	0.957
176.4	6.016	4.461	2.106	1.316	0.957
176.5	6.020	4.464	2.107	1.317	0.958
176.6	6.023	4.466	2.108	1.318	0.958
176.7	6.027	4.469	2.109	1.318	0.959
176.8	6.030	4.472	2.110	1.319	0.959
176.9	6.033	4.474	2.112	1.320	0.960
177.0	6.037	4.477	2.113	1.320	0.960
177.1	6.040	4.479	2.114	1.321	0.961
177.2	6.044	4.482	2.115	1.322	0.961
177.3	6.047	4.484	2.116	1.323	0.962
177.4	6.050	4.487	2.118	1.323	0.963
177.5	6.054	4.489	2.119	1.324	0.963
177.6	6.057	4.492	2.120	1.325	0.964
177.7	6.061	4.494	2.121	1.326	0.964
177.8	6.064	4.497	2.122	1.326	0.965
177.9	6.067	4.499	2.124	1.327	0.965
178.0	6.071	4.502	2.125	1.328	0.966
178.1	6.074	4.504	2.126	1.329	0.966
178.2	6.078	4.507	2.127	1.329	0.967
178.3	6.081	4.509	2.128	1.330	0.967
178.4	6.085	4.512	2.130	1.331	0.968
178.5	6.088	4.515	2.131	1.332	0.968
178.6	6.091	4.517	2.132	1.332	0.969
178.7	6.095	4.520	2.133	1.333	0.970
178.8	6.098	4.522	2.134	1.334	0.970
178.9	6.102	4.525	2.135	1.335	0.971
179.0	6.105	4.527	2.137	1.335	0.971
179.1	6.108	4.530	2.138	1.336	0.972
179.2	6.112	4.532	2.139	1.337	0.972
179.3	6.115	4.535	2.140	1.338	0.973
179.4	6.119	4.537	2.141	1.338	0.973
179.5	6.122	4.540	2.143	1.339	0.974
179.6	6.125	4.542	2.144	1.340	0.974
179.7	6.129	4.545	2.145	1.341	0.975
179.8	6.132	4.547	2.146	1.341	0.976
179.9	6.136	4.550	2.147	1.342	0.976

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
180.0	6.139	4.552	2.149	1.343	0.977
180.1	6.142	4.555	2.150	1.344	0.977
180.2	6.146	4.558	2.151	1.344	0.978
180.3	6.149	4.560	2.152	1.345	0.978
180.4	6.153	4.563	2.153	1.346	0.979
180.5	6.156	4.565	2.155	1.347	0.979
180.6	6.160	4.568	2.156	1.347	0.980
180.7	6.163	4.570	2.157	1.348	0.980
180.8	6.166	4.573	2.158	1.349	0.981
180.9	6.170	4.575	2.159	1.350	0.982
181.0	6.173	4.578	2.161	1.350	0.982
181.1	6.177	4.580	2.162	1.351	0.983
181.2	6.180	4.583	2.163	1.352	0.983
181.3	6.183	4.585	2.164	1.353	0.984
181.4	6.187	4.588	2.165	1.353	0.984
181.5	6.190	4.590	2.167	1.354	0.985
181.6	6.194	4.593	2.168	1.355	0.985
181.7	6.197	4.595	2.169	1.356	0.986
181.8	6.200	4.598	2.170	1.356	0.986
181.9	6.204	4.600	2.171	1.357	0.987
182.0	6.207	4.603	2.172	1.358	0.987
182.1	6.211	4.606	2.174	1.359	0.988
182.2	6.214	4.608	2.175	1.359	0.989
182.3	6.218	4.611	2.176	1.360	0.989
182.4	6.221	4.613	2.177	1.361	0.990
182.5	6.224	4.616	2.178	1.362	0.990
182.6	6.228	4.618	2.180	1.362	0.991
182.7	6.231	4.621	2.181	1.363	0.991
182.8	6.235	4.623	2.182	1.364	0.992
182.9	6.238	4.626	2.183	1.365	0.992
183.0	6.241	4.628	2.184	1.365	0.993
183.1	6.245	4.631	2.186	1.366	0.993
183.2	6.248	4.633	2.187	1.367	0.994
183.3	6.252	4.636	2.188	1.367	0.995
183.4	6.255	4.638	2.189	1.368	0.995
183.5	6.258	4.641	2.190	1.369	0.996
183.6	6.262	4.643	2.192	1.370	0.996
183.7	6.265	4.646	2.193	1.370	0.997
183.8	6.269	4.649	2.194	1.371	0.997
183.9	6.272	4.651	2.195	1.372	0.998
184.0	6.276	4.654	2.196	1.373	0.998
184.1	6.279	4.656	2.198	1.373	0.999
184.2	6.282	4.659	2.199	1.374	0.999
184.3	6.286	4.661	2.200	1.375	1.000
184.4	6.289	4.664	2.201	1.376	1.001
184.5	6.293	4.666	2.202	1.376	1.001
184.6	6.296	4.669	2.204	1.377	1.002
184.7	6.299	4.671	2.205	1.378	1.002
184.8	6.303	4.674	2.206	1.379	1.003
184.9	6.306	4.676	2.207	1.379	1.003

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
185.0	6.310	4.679	2.208	1.380	1.004
185.1	6.313	4.681	2.209	1.381	1.004
185.2	6.316	4.684	2.211	1.382	1.005
185.3	6.320	4.686	2.212	1.382	1.005
185.4	6.323	4.689	2.213	1.383	1.006
185.5	6.327	4.692	2.214	1.384	1.006
185.6	6.330	4.694	2.215	1.385	1.007
185.7	6.333	4.697	2.217	1.385	1.008
185.8	6.337	4.699	2.218	1.386	1.008
185.9	6.340	4.702	2.219	1.387	1.009
186.0	6.344	4.704	2.220	1.388	1.009
186.1	6.347	4.707	2.221	1.388	1.010
186.2	6.351	4.709	2.223	1.389	1.010
186.3	6.354	4.712	2.224	1.390	1.011
186.4	6.357	4.714	2.225	1.391	1.011
186.5	6.361	4.717	2.226	1.391	1.012
186.6	6.364	4.719	2.227	1.392	1.012
186.7	6.368	4.722	2.229	1.393	1.013
186.8	6.371	4.724	2.230	1.394	1.014
186.9	6.374	4.727	2.231	1.394	1.014
187.0	6.378	4.729	2.232	1.395	1.015
187.1	6.381	4.732	2.233	1.396	1.015
187.2	6.385	4.735	2.235	1.397	1.016
187.3	6.388	4.737	2.236	1.397	1.016
187.4	6.391	4.740	2.237	1.398	1.017
187.5	6.395	4.742	2.238	1.399	1.017
187.6	6.398	4.745	2.239	1.400	1.018
187.7	6.402	4.747	2.241	1.400	1.018
187.8	6.405	4.750	2.242	1.401	1.019
187.9	6.409	4.752	2.243	1.402	1.019
188.0	6.412	4.755	2.244	1.403	1.020
188.1	6.415	4.757	2.245	1.403	1.021
188.2	6.419	4.760	2.246	1.404	1.021
188.3	6.422	4.762	2.248	1.405	1.022
188.4	6.426	4.765	2.249	1.406	1.022
188.5	6.429	4.767	2.250	1.406	1.023
188.6	6.432	4.770	2.251	1.407	1.023
188.7	6.436	4.772	2.252	1.408	1.024
188.8	6.439	4.775	2.254	1.409	1.024
188.9	6.443	4.778	2.255	1.409	1.025
189.0	6.446	4.780	2.256	1.410	1.025
189.1	6.449	4.783	2.257	1.411	1.026
189.2	6.453	4.785	2.258	1.412	1.027
189.3	6.456	4.788	2.260	1.412	1.027
189.4	6.460	4.790	2.261	1.413	1.028
189.5	6.463	4.793	2.262	1.414	1.028
189.6	6.467	4.795	2.263	1.414	1.029
189.7	6.470	4.798	2.264	1.415	1.029
189.8	6.473	4.800	2.266	1.416	1.030
189.9	6.477	4.803	2.267	1.417	1.030

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
190.0	6.480	4.805	2.268	1.417	1.031
190.1	6.484	4.808	2.269	1.418	1.031
190.2	6.487	4.810	2.270	1.419	1.032
190.3	6.490	4.813	2.272	1.420	1.033
190.4	6.494	4.815	2.273	1.420	1.033
190.5	6.497	4.818	2.274	1.421	1.034
190.6	6.501	4.821	2.275	1.422	1.034
190.7	6.504	4.823	2.276	1.423	1.035
190.8	6.507	4.826	2.278	1.423	1.035
190.9	6.511	4.828	2.279	1.424	1.036
191.0	6.514	4.831	2.280	1.425	1.036
191.1	6.518	4.833	2.281	1.426	1.037
191.2	6.521	4.836	2.282	1.426	1.037
191.3	6.524	4.838	2.283	1.427	1.038
191.4	6.528	4.841	2.285	1.428	1.038
191.5	6.531	4.843	2.286	1.429	1.039
191.6	6.535	4.846	2.287	1.429	1.040
191.7	6.538	4.848	2.288	1.430	1.040
191.8	6.542	4.851	2.289	1.431	1.041
191.9	6.545	4.853	2.291	1.432	1.041
192.0	6.548	4.856	2.292	1.432	1.042
192.1	6.552	4.858	2.293	1.433	1.042
192.2	6.555	4.861	2.294	1.434	1.043
192.3	6.559	4.864	2.295	1.435	1.043
192.4	6.562	4.866	2.297	1.435	1.044
192.5	6.565	4.869	2.298	1.436	1.044
192.6	6.569	4.871	2.299	1.437	1.045
192.7	6.572	4.874	2.300	1.438	1.046
192.8	6.576	4.876	2.301	1.438	1.046
192.9	6.579	4.879	2.303	1.439	1.047
193.0	6.582	4.881	2.304	1.440	1.047
193.1	6.586	4.884	2.305	1.441	1.048
193.2	6.589	4.886	2.306	1.441	1.048
193.3	6.593	4.889	2.307	1.442	1.049
193.4	6.596	4.891	2.309	1.443	1.049
193.5	6.600	4.894	2.310	1.444	1.050
193.6	6.603	4.896	2.311	1.444	1.050
193.7	6.606	4.899	2.312	1.445	1.051
193.8	6.610	4.901	2.313	1.446	1.052
193.9	6.613	4.904	2.315	1.447	1.052
194.0	6.617	4.907	2.316	1.447	1.053
194.1	6.620	4.909	2.317	1.448	1.053
194.2	6.623	4.912	2.318	1.449	1.054
194.3	6.627	4.914	2.319	1.450	1.054
194.4	6.630	4.917	2.320	1.450	1.055
194.5	6.634	4.919	2.322	1.451	1.055
194.6	6.637	4.922	2.323	1.452	1.056
194.7	6.640	4.924	2.324	1.453	1.056
194.8	6.644	4.927	2.325	1.453	1.057
194.9	6.647	4.929	2.326	1.454	1.057

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
195.0	6.651	4.932	2.328	1.455	1.058
195.1	6.654	4.934	2.329	1.456	1.059
195.2	6.657	4.937	2.330	1.456	1.059
195.3	6.661	4.939	2.331	1.457	1.060
195.4	6.664	4.942	2.332	1.458	1.060
195.5	6.668	4.944	2.334	1.459	1.061
195.6	6.671	4.947	2.335	1.459	1.061
195.7	6.675	4.950	2.336	1.460	1.062
195.8	6.678	4.952	2.337	1.461	1.062
195.9	6.681	4.955	2.338	1.462	1.063
196.0	6.685	4.957	2.340	1.462	1.063
196.1	6.688	4.960	2.341	1.463	1.064
196.2	6.692	4.962	2.342	1.464	1.065
196.3	6.695	4.965	2.343	1.464	1.065
196.4	6.698	4.967	2.344	1.465	1.066
196.5	6.702	4.970	2.346	1.466	1.066
196.6	6.705	4.972	2.347	1.467	1.067
196.7	6.709	4.975	2.348	1.467	1.067
196.8	6.712	4.977	2.349	1.468	1.068
196.9	6.715	4.980	2.350	1.469	1.068
197.0	6.719	4.982	2.352	1.470	1.069
197.1	6.722	4.985	2.353	1.470	1.069
197.2	6.726	4.987	2.354	1.471	1.070
197.3	6.729	4.990	2.355	1.472	1.071
197.4	6.733	4.993	2.356	1.473	1.071
197.5	6.736	4.995	2.357	1.473	1.072
197.6	6.739	4.998	2.359	1.474	1.072
197.7	6.743	5.000	2.360	1.475	1.073
197.8	6.746	5.003	2.361	1.476	1.073
197.9	6.750	5.005	2.362	1.476	1.074
198.0	6.753	5.008	2.363	1.477	1.074
198.1	6.756	5.010	2.365	1.478	1.075
198.2	6.760	5.013	2.366	1.479	1.075
198.3	6.763	5.015	2.367	1.479	1.076
198.4	6.767	5.018	2.368	1.480	1.076
198.5	6.770	5.020	2.369	1.481	1.077
198.6	6.773	5.023	2.371	1.482	1.078
198.7	6.777	5.025	2.372	1.482	1.078
198.8	6.780	5.028	2.373	1.483	1.079
198.9	6.784	5.030	2.374	1.484	1.079
199.0	6.787	5.033	2.375	1.485	1.080
199.1	6.791	5.036	2.377	1.485	1.080
199.2	6.794	5.038	2.378	1.486	1.081
199.3	6.797	5.041	2.379	1.487	1.081
199.4	6.801	5.043	2.380	1.488	1.082
199.5	6.804	5.046	2.381	1.488	1.082
199.6	6.808	5.048	2.383	1.489	1.083
199.7	6.811	5.051	2.384	1.490	1.084
199.8	6.814	5.053	2.385	1.491	1.084
199.9	6.818	5.056	2.386	1.491	1.085

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
200.0	6.821	5.058	2.387	1.492	1.085
200.1	6.825	5.061	2.389	1.493	1.086
200.2	6.828	5.063	2.390	1.494	1.086
200.3	6.831	5.066	2.391	1.494	1.087
200.4	6.835	5.068	2.392	1.495	1.087
200.5	6.838	5.071	2.393	1.496	1.088
200.6	6.842	5.073	2.394	1.497	1.088
200.7	6.845	5.076	2.396	1.497	1.089
200.8	6.848	5.079	2.397	1.498	1.089
200.9	6.852	5.081	2.398	1.499	1.090
201.0	6.855	5.084	2.399	1.500	1.091
201.1	6.859	5.086	2.400	1.500	1.091
201.2	6.862	5.089	2.402	1.501	1.092
201.3	6.866	5.091	2.403	1.502	1.092
201.4	6.869	5.094	2.404	1.503	1.093
201.5	6.872	5.096	2.405	1.503	1.093
201.6	6.876	5.099	2.406	1.504	1.094
201.7	6.879	5.101	2.408	1.505	1.094
201.8	6.883	5.104	2.409	1.506	1.095
201.9	6.886	5.106	2.410	1.506	1.095
202.0	6.889	5.109	2.411	1.507	1.096
202.1	6.893	5.111	2.412	1.508	1.097
202.2	6.896	5.114	2.414	1.509	1.097
202.3	6.900	5.116	2.415	1.509	1.098
202.4	6.903	5.119	2.416	1.510	1.098
202.5	6.906	5.121	2.417	1.511	1.099
202.6	6.910	5.124	2.418	1.511	1.099
202.7	6.913	5.127	2.420	1.512	1.100
202.8	6.917	5.129	2.421	1.513	1.100
202.9	6.920	5.132	2.422	1.514	1.101
203.0	6.924	5.134	2.423	1.514	1.101
203.1	6.927	5.137	2.424	1.515	1.102
203.2	6.930	5.139	2.426	1.516	1.103
203.3	6.934	5.142	2.427	1.517	1.103
203.4	6.937	5.144	2.428	1.517	1.104
203.5	6.941	5.147	2.429	1.518	1.104
203.6	6.944	5.149	2.430	1.519	1.105
203.7	6.947	5.152	2.432	1.520	1.105
203.8	6.951	5.154	2.433	1.520	1.106
203.9	6.954	5.157	2.434	1.521	1.106
204.0	6.958	5.159	2.435	1.522	1.107
204.1	6.961	5.162	2.436	1.523	1.107
204.2	6.964	5.164	2.437	1.523	1.108
204.3	6.968	5.167	2.439	1.524	1.108
204.4	6.971	5.170	2.440	1.525	1.109
204.5	6.975	5.172	2.441	1.526	1.110
204.6	6.978	5.175	2.442	1.526	1.110
204.7	6.982	5.177	2.443	1.527	1.111
204.8	6.985	5.180	2.445	1.528	1.111
204.9	6.988	5.182	2.446	1.529	1.112

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
205.0	6.992	5.185	2.447	1.529	1.112
205.1	6.995	5.187	2.448	1.530	1.113
205.2	6.999	5.190	2.449	1.531	1.113
205.3	7.002	5.192	2.451	1.532	1.114
205.4	7.005	5.195	2.452	1.532	1.114
205.5	7.009	5.197	2.453	1.533	1.115
205.6	7.012	5.200	2.454	1.534	1.116
205.7	7.016	5.202	2.455	1.535	1.116
205.8	7.019	5.205	2.457	1.535	1.117
205.9	7.022	5.207	2.458	1.536	1.117
206.0	7.026	5.210	2.459	1.537	1.118
206.1	7.029	5.213	2.460	1.538	1.118
206.2	7.033	5.215	2.461	1.538	1.119
206.3	7.036	5.218	2.463	1.539	1.119
206.4	7.039	5.220	2.464	1.540	1.120
206.5	7.043	5.223	2.465	1.541	1.120
206.6	7.046	5.225	2.466	1.541	1.121
206.7	7.050	5.228	2.467	1.542	1.122
206.8	7.053	5.230	2.469	1.543	1.122
206.9	7.057	5.233	2.470	1.544	1.123
207.0	7.060	5.235	2.471	1.544	1.123
207.1	7.063	5.238	2.472	1.545	1.124
207.2	7.067	5.240	2.473	1.546	1.124
207.3	7.070	5.243	2.474	1.547	1.125
207.4	7.074	5.245	2.476	1.547	1.125
207.5	7.077	5.248	2.477	1.548	1.126
207.6	7.080	5.250	2.478	1.549	1.126
207.7	7.084	5.253	2.479	1.550	1.127
207.8	7.087	5.256	2.480	1.550	1.127
207.9	7.091	5.258	2.482	1.551	1.128
208.0	7.094	5.261	2.483	1.552	1.129
208.1	7.097	5.263	2.484	1.553	1.129
208.2	7.101	5.266	2.485	1.553	1.130
208.3	7.104	5.268	2.486	1.554	1.130
208.4	7.108	5.271	2.488	1.555	1.131
208.5	7.111	5.273	2.489	1.556	1.131
208.6	7.115	5.276	2.490	1.556	1.132
208.7	7.118	5.278	2.491	1.557	1.132
208.8	7.121	5.281	2.492	1.558	1.133
208.9	7.125	5.283	2.494	1.558	1.133
209.0	7.128	5.286	2.495	1.559	1.134
209.1	7.132	5.288	2.496	1.560	1.135
209.2	7.135	5.291	2.497	1.561	1.135
209.3	7.138	5.293	2.498	1.561	1.136
209.4	7.142	5.296	2.500	1.562	1.136
209.5	7.145	5.299	2.501	1.563	1.137
209.6	7.149	5.301	2.502	1.564	1.137
209.7	7.152	5.304	2.503	1.564	1.138
209.8	7.155	5.306	2.504	1.565	1.138
209.9	7.159	5.309	2.506	1.566	1.139

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
210.0	7.162	5.311	2.507	1.567	1.139
210.1	7.166	5.314	2.508	1.567	1.140
210.2	7.169	5.316	2.509	1.568	1.140
210.3	7.172	5.319	2.510	1.569	1.141
210.4	7.176	5.321	2.511	1.570	1.142
210.5	7.179	5.324	2.513	1.570	1.142
210.6	7.183	5.326	2.514	1.571	1.143
210.7	7.186	5.329	2.515	1.572	1.143
210.8	7.190	5.331	2.516	1.573	1.144
210.9	7.193	5.334	2.517	1.573	1.144
211.0	7.196	5.336	2.519	1.574	1.145
211.1	7.200	5.339	2.520	1.575	1.145
211.2	7.203	5.342	2.521	1.576	1.146
211.3	7.207	5.344	2.522	1.576	1.146
211.4	7.210	5.347	2.523	1.577	1.147
211.5	7.213	5.349	2.525	1.578	1.148
211.6	7.217	5.352	2.526	1.579	1.148
211.7	7.220	5.354	2.527	1.579	1.149
211.8	7.224	5.357	2.528	1.580	1.149
211.9	7.227	5.359	2.529	1.581	1.150
212.0	7.230	5.362	2.531	1.582	1.150
212.1	7.234	5.364	2.532	1.582	1.151
212.2	7.237	5.367	2.533	1.583	1.151
212.3	7.241	5.369	2.534	1.584	1.152
212.4	7.244	5.372	2.535	1.585	1.152
212.5	7.248	5.374	2.537	1.585	1.153
212.6	7.251	5.377	2.538	1.586	1.154
212.7	7.254	5.379	2.539	1.587	1.154
212.8	7.258	5.382	2.540	1.588	1.155
212.9	7.261	5.385	2.541	1.588	1.155
213.0	7.265	5.387	2.543	1.589	1.156
213.1	7.268	5.390	2.544	1.590	1.156
213.2	7.271	5.392	2.545	1.591	1.157
213.3	7.275	5.395	2.546	1.591	1.157
213.4	7.278	5.397	2.547	1.592	1.158
213.5	7.282	5.400	2.548	1.593	1.158
213.6	7.285	5.402	2.550	1.594	1.159
213.7	7.288	5.405	2.551	1.594	1.159
213.8	7.292	5.407	2.552	1.595	1.160
213.9	7.295	5.410	2.553	1.596	1.161
214.0	7.299	5.412	2.554	1.597	1.161
214.1	7.302	5.415	2.556	1.597	1.162
214.2	7.306	5.417	2.557	1.598	1.162
214.3	7.309	5.420	2.558	1.599	1.163
214.4	7.312	5.422	2.559	1.600	1.163
214.5	7.316	5.425	2.560	1.600	1.164
214.6	7.319	5.428	2.562	1.601	1.164
214.7	7.323	5.430	2.563	1.602	1.165
214.8	7.326	5.433	2.564	1.603	1.165
214.9	7.329	5.435	2.565	1.603	1.166

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
215.0	7.333	5.438	2.566	1.604	1.167
215.1	7.336	5.440	2.568	1.605	1.167
215.2	7.340	5.443	2.569	1.605	1.168
215.3	7.343	5.445	2.570	1.606	1.168
215.4	7.346	5.448	2.571	1.607	1.169
215.5	7.350	5.450	2.572	1.608	1.169
215.6	7.353	5.453	2.574	1.608	1.170
215.7	7.357	5.455	2.575	1.609	1.170
215.8	7.360	5.458	2.576	1.610	1.171
215.9	7.363	5.460	2.577	1.611	1.171
216.0	7.367	5.463	2.578	1.611	1.172
216.1	7.370	5.465	2.580	1.612	1.173
216.2	7.374	5.468	2.581	1.613	1.173
216.3	7.377	5.471	2.582	1.614	1.174
216.4	7.381	5.473	2.583	1.614	1.174
216.5	7.384	5.476	2.584	1.615	1.175
216.6	7.387	5.478	2.585	1.616	1.175
216.7	7.391	5.481	2.587	1.617	1.176
216.8	7.394	5.483	2.588	1.617	1.176
216.9	7.398	5.486	2.589	1.618	1.177
217.0	7.401	5.488	2.590	1.619	1.177
217.1	7.404	5.491	2.591	1.620	1.178
217.2	7.408	5.493	2.593	1.620	1.178
217.3	7.411	5.496	2.594	1.621	1.179
217.4	7.415	5.498	2.595	1.622	1.180
217.5	7.418	5.501	2.596	1.623	1.180
217.6	7.421	5.503	2.597	1.623	1.181
217.7	7.425	5.506	2.599	1.624	1.181
217.8	7.428	5.508	2.600	1.625	1.182
217.9	7.432	5.511	2.601	1.626	1.182
218.0	7.435	5.514	2.602	1.626	1.183
218.1	7.439	5.516	2.603	1.627	1.183
218.2	7.442	5.519	2.605	1.628	1.184
218.3	7.445	5.521	2.606	1.629	1.184
218.4	7.449	5.524	2.607	1.629	1.185
218.5	7.452	5.526	2.608	1.630	1.186
218.6	7.456	5.529	2.609	1.631	1.186
218.7	7.459	5.531	2.611	1.632	1.187
218.8	7.462	5.534	2.612	1.632	1.187
218.9	7.466	5.536	2.613	1.633	1.188
219.0	7.469	5.539	2.614	1.634	1.188
219.1	7.473	5.541	2.615	1.635	1.189
219.2	7.476	5.544	2.617	1.635	1.189
219.3	7.479	5.546	2.618	1.636	1.190
219.4	7.483	5.549	2.619	1.637	1.190
219.5	7.486	5.551	2.620	1.638	1.191
219.6	7.490	5.554	2.621	1.638	1.191
219.7	7.493	5.557	2.622	1.639	1.192
219.8	7.497	5.559	2.624	1.640	1.193
219.9	7.500	5.562	2.625	1.641	1.193

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
220.0	7.503	5.564	2.626	1.641	1.194
220.1	7.507	5.567	2.627	1.642	1.194
220.2	7.510	5.569	2.628	1.643	1.195
220.3	7.514	5.572	2.630	1.644	1.195
220.4	7.517	5.574	2.631	1.644	1.196
220.5	7.520	5.577	2.632	1.645	1.196
220.6	7.524	5.579	2.633	1.646	1.197
220.7	7.527	5.582	2.634	1.647	1.197
220.8	7.531	5.584	2.636	1.647	1.198
220.9	7.534	5.587	2.637	1.648	1.199
221.0	7.537	5.589	2.638	1.649	1.199
221.1	7.541	5.592	2.639	1.650	1.200
221.2	7.544	5.594	2.640	1.650	1.200
221.3	7.548	5.597	2.642	1.651	1.201
221.4	7.551	5.600	2.643	1.652	1.201
221.5	7.554	5.602	2.644	1.652	1.202
221.6	7.558	5.605	2.645	1.653	1.202
221.7	7.561	5.607	2.646	1.654	1.203
221.8	7.565	5.610	2.648	1.655	1.203
221.9	7.568	5.612	2.649	1.655	1.204
222.0	7.572	5.615	2.650	1.656	1.205
222.1	7.575	5.617	2.651	1.657	1.205
222.2	7.578	5.620	2.652	1.658	1.206
222.3	7.582	5.622	2.654	1.658	1.206
222.4	7.585	5.625	2.655	1.659	1.207
222.5	7.589	5.627	2.656	1.660	1.207
222.6	7.592	5.630	2.657	1.661	1.208
222.7	7.595	5.632	2.658	1.661	1.208
222.8	7.599	5.635	2.659	1.662	1.209
222.9	7.602	5.637	2.661	1.663	1.209
223.0	7.606	5.640	2.662	1.664	1.210
223.1	7.609	5.642	2.663	1.664	1.210
223.2	7.612	5.645	2.664	1.665	1.211
223.3	7.616	5.648	2.665	1.666	1.212
223.4	7.619	5.650	2.667	1.667	1.212
223.5	7.623	5.653	2.668	1.667	1.213
223.6	7.626	5.655	2.669	1.668	1.213
223.7	7.630	5.658	2.670	1.669	1.214
223.8	7.633	5.660	2.671	1.670	1.214
223.9	7.636	5.663	2.673	1.670	1.215
224.0	7.640	5.665	2.674	1.671	1.215
224.1	7.643	5.668	2.675	1.672	1.216
224.2	7.647	5.670	2.676	1.673	1.216
224.3	7.650	5.673	2.677	1.673	1.217
224.4	7.653	5.675	2.679	1.674	1.218
224.5	7.657	5.678	2.680	1.675	1.218
224.6	7.660	5.680	2.681	1.676	1.219
224.7	7.664	5.683	2.682	1.676	1.219
224.8	7.667	5.685	2.683	1.677	1.220
224.9	7.670	5.688	2.685	1.678	1.220

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
225.0	7.674	5.691	2.686	1.679	1.221
225.1	7.677	5.693	2.687	1.679	1.221
225.2	7.681	5.696	2.688	1.680	1.222
225.3	7.684	5.698	2.689	1.681	1.222
225.4	7.688	5.701	2.691	1.682	1.223
225.5	7.691	5.703	2.692	1.682	1.224
225.6	7.694	5.706	2.693	1.683	1.224
225.7	7.698	5.708	2.694	1.684	1.225
225.8	7.701	5.711	2.695	1.685	1.225
225.9	7.705	5.713	2.696	1.685	1.226
226.0	7.708	5.716	2.698	1.686	1.226
226.1	7.711	5.718	2.699	1.687	1.227
226.2	7.715	5.721	2.700	1.688	1.227
226.3	7.718	5.723	2.701	1.688	1.228
226.4	7.722	5.726	2.702	1.689	1.228
226.5	7.725	5.728	2.704	1.690	1.229
226.6	7.728	5.731	2.705	1.691	1.229
226.7	7.732	5.734	2.706	1.691	1.230
226.8	7.735	5.736	2.707	1.692	1.231
226.9	7.739	5.739	2.708	1.693	1.231
227.0	7.742	5.741	2.710	1.694	1.232
227.1	7.745	5.744	2.711	1.694	1.232
227.2	7.749	5.746	2.712	1.695	1.233
227.3	7.752	5.749	2.713	1.696	1.233
227.4	7.756	5.751	2.714	1.697	1.234
227.5	7.759	5.754	2.716	1.697	1.234
227.6	7.763	5.756	2.717	1.698	1.235
227.7	7.766	5.759	2.718	1.699	1.235
227.8	7.769	5.761	2.719	1.699	1.236
227.9	7.773	5.764	2.720	1.700	1.237
228.0	7.776	5.766	2.722	1.701	1.237
228.1	7.780	5.769	2.723	1.702	1.238
228.2	7.783	5.771	2.724	1.702	1.238
228.3	7.786	5.774	2.725	1.703	1.239
228.4	7.790	5.777	2.726	1.704	1.239
228.5	7.793	5.779	2.728	1.705	1.240
228.6	7.797	5.782	2.729	1.705	1.240
228.7	7.800	5.784	2.730	1.706	1.241
228.8	7.803	5.787	2.731	1.707	1.241
228.9	7.807	5.789	2.732	1.708	1.242
229.0	7.810	5.792	2.734	1.708	1.242
229.1	7.814	5.794	2.735	1.709	1.243
229.2	7.817	5.797	2.736	1.710	1.244
229.3	7.821	5.799	2.737	1.711	1.244
229.4	7.824	5.802	2.738	1.711	1.245
229.5	7.827	5.804	2.739	1.712	1.245
229.6	7.831	5.807	2.741	1.713	1.246
229.7	7.834	5.809	2.742	1.714	1.246
229.8	7.838	5.812	2.743	1.714	1.247
229.9	7.841	5.814	2.744	1.715	1.247

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
230.0	7.844	5.817	2.745	1.716	1.248
230.1	7.848	5.820	2.747	1.717	1.248
230.2	7.851	5.822	2.748	1.717	1.249
230.3	7.855	5.825	2.749	1.718	1.250
230.4	7.858	5.827	2.750	1.719	1.250
230.5	7.861	5.830	2.751	1.720	1.251
230.6	7.865	5.832	2.753	1.720	1.251
230.7	7.868	5.835	2.754	1.721	1.252
230.8	7.872	5.837	2.755	1.722	1.252
230.9	7.875	5.840	2.756	1.723	1.253
231.0	7.878	5.842	2.757	1.723	1.253
231.1	7.882	5.845	2.759	1.724	1.254
231.2	7.885	5.847	2.760	1.725	1.254
231.3	7.889	5.850	2.761	1.726	1.255
231.4	7.892	5.852	2.762	1.726	1.256
231.5	7.896	5.855	2.763	1.727	1.256
231.6	7.899	5.857	2.765	1.728	1.257
231.7	7.902	5.860	2.766	1.729	1.257
231.8	7.906	5.863	2.767	1.729	1.258
231.9	7.909	5.865	2.768	1.730	1.258
232.0	7.913	5.868	2.769	1.731	1.259
232.1	7.916	5.870	2.771	1.732	1.259
232.2	7.919	5.873	2.772	1.732	1.260
232.3	7.923	5.875	2.773	1.733	1.260
232.4	7.926	5.878	2.774	1.734	1.261
232.5	7.930	5.880	2.775	1.735	1.261
232.6	7.933	5.883	2.776	1.735	1.262
232.7	7.936	5.885	2.778	1.736	1.263
232.8	7.940	5.888	2.779	1.737	1.263
232.9	7.943	5.890	2.780	1.738	1.264
233.0	7.947	5.893	2.781	1.738	1.264
233.1	7.950	5.895	2.782	1.739	1.265
233.2	7.954	5.898	2.784	1.740	1.265
233.3	7.957	5.900	2.785	1.741	1.266
233.4	7.960	5.903	2.786	1.741	1.266
233.5	7.964	5.906	2.787	1.742	1.267
233.6	7.967	5.908	2.788	1.743	1.267
233.7	7.971	5.911	2.790	1.744	1.268
233.8	7.974	5.913	2.791	1.744	1.269
233.9	7.977	5.916	2.792	1.745	1.269
234.0	7.981	5.918	2.793	1.746	1.270
234.1	7.984	5.921	2.794	1.746	1.270
234.2	7.988	5.923	2.796	1.747	1.271
234.3	7.991	5.926	2.797	1.748	1.271
234.4	7.994	5.928	2.798	1.749	1.272
234.5	7.998	5.931	2.799	1.749	1.272
234.6	8.001	5.933	2.800	1.750	1.273
234.7	8.005	5.936	2.802	1.751	1.273
234.8	8.008	5.938	2.803	1.752	1.274
234.9	8.012	5.941	2.804	1.752	1.275

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
235.0	8.015	5.943	2.805	1.753	1.275
235.1	8.018	5.946	2.806	1.754	1.276
235.2	8.022	5.949	2.808	1.755	1.276
235.3	8.025	5.951	2.809	1.755	1.277
235.4	8.029	5.954	2.810	1.756	1.277
235.5	8.032	5.956	2.811	1.757	1.278
235.6	8.035	5.959	2.812	1.758	1.278
235.7	8.039	5.961	2.813	1.758	1.279
235.8	8.042	5.964	2.815	1.759	1.279
235.9	8.046	5.966	2.816	1.760	1.280
236.0	8.049	5.969	2.817	1.761	1.280
236.1	8.052	5.971	2.818	1.761	1.281
236.2	8.056	5.974	2.819	1.762	1.282
236.3	8.059	5.976	2.821	1.763	1.282
236.4	8.063	5.979	2.822	1.764	1.283
236.5	8.066	5.981	2.823	1.764	1.283
236.6	8.069	5.984	2.824	1.765	1.284
236.7	8.073	5.986	2.825	1.766	1.284
236.8	8.076	5.989	2.827	1.767	1.285
236.9	8.080	5.992	2.828	1.767	1.285
237.0	8.083	5.994	2.829	1.768	1.286
237.1	8.087	5.997	2.830	1.769	1.286
237.2	8.090	5.999	2.831	1.770	1.287
237.3	8.093	6.002	2.833	1.770	1.288
237.4	8.097	6.004	2.834	1.771	1.288
237.5	8.100	6.007	2.835	1.772	1.289
237.6	8.104	6.009	2.836	1.773	1.289
237.7	8.107	6.012	2.837	1.773	1.290
237.8	8.110	6.014	2.839	1.774	1.290
237.9	8.114	6.017	2.840	1.775	1.291
238.0	8.117	6.019	2.841	1.776	1.291
238.1	8.121	6.022	2.842	1.776	1.292
238.2	8.124	6.024	2.843	1.777	1.292
238.3	8.127	6.027	2.845	1.778	1.293
238.4	8.131	6.029	2.846	1.779	1.294
238.5	8.134	6.032	2.847	1.779	1.294
238.6	8.138	6.035	2.848	1.780	1.295
238.7	8.141	6.037	2.849	1.781	1.295
238.8	8.145	6.040	2.850	1.782	1.296
238.9	8.148	6.042	2.852	1.782	1.296
239.0	8.151	6.045	2.853	1.783	1.297
239.1	8.155	6.047	2.854	1.784	1.297
239.2	8.158	6.050	2.855	1.785	1.298
239.3	8.162	6.052	2.856	1.785	1.298
239.4	8.165	6.055	2.858	1.786	1.299
239.5	8.168	6.057	2.859	1.787	1.299
239.6	8.172	6.060	2.860	1.788	1.300
239.7	8.175	6.062	2.861	1.788	1.301
239.8	8.179	6.065	2.862	1.789	1.301
239.9	8.182	6.067	2.864	1.790	1.302

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
240.0	8.185	6.070	2.865	1.791	1.302
240.1	8.189	6.072	2.866	1.791	1.303
240.2	8.192	6.075	2.867	1.792	1.303
240.3	8.196	6.078	2.868	1.793	1.304
240.4	8.199	6.080	2.870	1.793	1.304
240.5	8.203	6.083	2.871	1.794	1.305
240.6	8.206	6.085	2.872	1.795	1.305
240.7	8.209	6.088	2.873	1.796	1.306
240.8	8.213	6.090	2.874	1.796	1.307
240.9	8.216	6.093	2.876	1.797	1.307
241.0	8.220	6.095	2.877	1.798	1.308
241.1	8.223	6.098	2.878	1.799	1.308
241.2	8.226	6.100	2.879	1.799	1.309
241.3	8.230	6.103	2.880	1.800	1.309
241.4	8.233	6.105	2.882	1.801	1.310
241.5	8.237	6.108	2.883	1.802	1.310
241.6	8.240	6.110	2.884	1.802	1.311
241.7	8.243	6.113	2.885	1.803	1.311
241.8	8.247	6.115	2.886	1.804	1.312
241.9	8.250	6.118	2.887	1.805	1.312
242.0	8.254	6.121	2.889	1.805	1.313
242.1	8.257	6.123	2.890	1.806	1.314
242.2	8.260	6.126	2.891	1.807	1.314
242.3	8.264	6.128	2.892	1.808	1.315
242.4	8.267	6.131	2.893	1.808	1.315
242.5	8.271	6.133	2.895	1.809	1.316
242.6	8.274	6.136	2.896	1.810	1.316
242.7	8.278	6.138	2.897	1.811	1.317
242.8	8.281	6.141	2.898	1.811	1.317
242.9	8.284	6.143	2.899	1.812	1.318
243.0	8.288	6.146	2.901	1.813	1.318
243.1	8.291	6.148	2.902	1.814	1.319
243.2	8.295	6.151	2.903	1.814	1.320
243.3	8.298	6.153	2.904	1.815	1.320
243.4	8.301	6.156	2.905	1.816	1.321
243.5	8.305	6.158	2.907	1.817	1.321
243.6	8.308	6.161	2.908	1.817	1.322
243.7	8.312	6.164	2.909	1.818	1.322
243.8	8.315	6.166	2.910	1.819	1.323
243.9	8.318	6.169	2.911	1.820	1.323
244.0	8.322	6.171	2.913	1.820	1.324
244.1	8.325	6.174	2.914	1.821	1.324
244.2	8.329	6.176	2.915	1.822	1.325
244.3	8.332	6.179	2.916	1.823	1.326
244.4	8.336	6.181	2.917	1.823	1.326
244.5	8.339	6.184	2.919	1.824	1.327
244.6	8.342	6.186	2.920	1.825	1.327
244.7	8.346	6.189	2.921	1.826	1.328
244.8	8.349	6.191	2.922	1.826	1.328
244.9	8.353	6.194	2.923	1.827	1.329

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
245.0	8.356	6.196	2.924	1.828	1.329
245.1	8.359	6.199	2.926	1.829	1.330
245.2	8.363	6.201	2.927	1.829	1.330
245.3	8.366	6.204	2.928	1.830	1.331
245.4	8.370	6.206	2.929	1.831	1.331
245.5	8.373	6.209	2.930	1.832	1.332
245.6	8.376	6.212	2.932	1.832	1.333
245.7	8.380	6.214	2.933	1.833	1.333
245.8	8.383	6.217	2.934	1.834	1.334
245.9	8.387	6.219	2.935	1.835	1.334
246.0	8.390	6.222	2.936	1.835	1.335
246.1	8.393	6.224	2.938	1.836	1.335
246.2	8.397	6.227	2.939	1.837	1.336
246.3	8.400	6.229	2.940	1.838	1.336
246.4	8.404	6.232	2.941	1.838	1.337
246.5	8.407	6.234	2.942	1.839	1.337
246.6	8.411	6.237	2.944	1.840	1.338
246.7	8.414	6.239	2.945	1.840	1.339
246.8	8.417	6.242	2.946	1.841	1.339
246.9	8.421	6.244	2.947	1.842	1.340
247.0	8.424	6.247	2.948	1.843	1.340
247.1	8.428	6.249	2.950	1.843	1.341
247.2	8.431	6.252	2.951	1.844	1.341
247.3	8.434	6.255	2.952	1.845	1.342
247.4	8.438	6.257	2.953	1.846	1.342
247.5	8.441	6.260	2.954	1.846	1.343
247.6	8.445	6.262	2.956	1.847	1.343
247.7	8.448	6.265	2.957	1.848	1.344
247.8	8.451	6.267	2.958	1.849	1.345
247.9	8.455	6.270	2.959	1.849	1.345
248.0	8.458	6.272	2.960	1.850	1.346
248.1	8.462	6.275	2.961	1.851	1.346
248.2	8.465	6.277	2.963	1.852	1.347
248.3	8.469	6.280	2.964	1.852	1.347
248.4	8.472	6.282	2.965	1.853	1.348
248.5	8.475	6.285	2.966	1.854	1.348
248.6	8.479	6.287	2.967	1.855	1.349
248.7	8.482	6.290	2.969	1.855	1.349
248.8	8.486	6.292	2.970	1.856	1.350
248.9	8.489	6.295	2.971	1.857	1.350
249.0	8.492	6.298	2.972	1.858	1.351
249.1	8.496	6.300	2.973	1.858	1.352
249.2	8.499	6.303	2.975	1.859	1.352
249.3	8.503	6.305	2.976	1.860	1.353
249.4	8.506	6.308	2.977	1.861	1.353
249.5	8.509	6.310	2.978	1.861	1.354
249.6	8.513	6.313	2.979	1.862	1.354
249.7	8.516	6.315	2.981	1.863	1.355
249.8	8.520	6.318	2.982	1.864	1.355
249.9	8.523	6.320	2.983	1.864	1.356

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
250.0	8.527	6.323	2.984	1.865	1.356
250.1	8.530	6.325	2.985	1.866	1.357
250.2	8.533	6.328	2.987	1.867	1.358
250.3	8.537	6.330	2.988	1.867	1.358
250.4	8.540	6.333	2.989	1.868	1.359
250.5	8.544	6.335	2.990	1.869	1.359
250.6	8.547	6.338	2.991	1.870	1.360
250.7	8.550	6.341	2.993	1.870	1.360
250.8	8.554	6.343	2.994	1.871	1.361
250.9	8.557	6.346	2.995	1.872	1.361
251.0	8.561	6.348	2.996	1.873	1.362
251.1	8.564	6.351	2.997	1.873	1.362
251.2	8.567	6.353	2.998	1.874	1.363
251.3	8.571	6.356	3.000	1.875	1.363
251.4	8.574	6.358	3.001	1.876	1.364
251.5	8.578	6.361	3.002	1.876	1.365
251.6	8.581	6.363	3.003	1.877	1.365
251.7	8.584	6.366	3.004	1.878	1.366
251.8	8.588	6.368	3.006	1.879	1.366
251.9	8.591	6.371	3.007	1.879	1.367
252.0	8.595	6.373	3.008	1.880	1.367
252.1	8.598	6.376	3.009	1.881	1.368
252.2	8.602	6.378	3.010	1.882	1.368
252.3	8.605	6.381	3.012	1.882	1.369
252.4	8.608	6.384	3.013	1.883	1.369
252.5	8.612	6.386	3.014	1.884	1.370
252.6	8.615	6.389	3.015	1.885	1.371
252.7	8.619	6.391	3.016	1.885	1.371
252.8	8.622	6.394	3.018	1.886	1.372
252.9	8.625	6.396	3.019	1.887	1.372
253.0	8.629	6.399	3.020	1.887	1.373
253.1	8.632	6.401	3.021	1.888	1.373
253.2	8.636	6.404	3.022	1.889	1.374
253.3	8.639	6.406	3.024	1.890	1.374
253.4	8.642	6.409	3.025	1.890	1.375
253.5	8.646	6.411	3.026	1.891	1.375
253.6	8.649	6.414	3.027	1.892	1.376
253.7	8.653	6.416	3.028	1.893	1.377
253.8	8.656	6.419	3.030	1.893	1.377
253.9	8.660	6.421	3.031	1.894	1.378
254.0	8.663	6.424	3.032	1.895	1.378
254.1	8.666	6.427	3.033	1.896	1.379
254.2	8.670	6.429	3.034	1.896	1.379
254.3	8.673	6.432	3.035	1.897	1.380
254.4	8.677	6.434	3.037	1.898	1.380
254.5	8.680	6.437	3.038	1.899	1.381
254.6	8.683	6.439	3.039	1.899	1.381
254.7	8.687	6.442	3.040	1.900	1.382
254.8	8.690	6.444	3.041	1.901	1.382
254.9	8.694	6.447	3.043	1.902	1.383

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
255.0	8.697	6.449	3.044	1.902	1.384
255.1	8.700	6.452	3.045	1.903	1.384
255.2	8.704	6.454	3.046	1.904	1.385
255.3	8.707	6.457	3.047	1.905	1.385
255.4	8.711	6.459	3.049	1.905	1.386
255.5	8.714	6.462	3.050	1.906	1.386
255.6	8.718	6.464	3.051	1.907	1.387
255.7	8.721	6.467	3.052	1.908	1.387
255.8	8.724	6.470	3.053	1.908	1.388
255.9	8.728	6.472	3.055	1.909	1.388
256.0	8.731	6.475	3.056	1.910	1.389
256.1	8.735	6.477	3.057	1.911	1.390
256.2	8.738	6.480	3.058	1.911	1.390
256.3	8.741	6.482	3.059	1.912	1.391
256.4	8.745	6.485	3.061	1.913	1.391
256.5	8.748	6.487	3.062	1.914	1.392
256.6	8.752	6.490	3.063	1.914	1.392
256.7	8.755	6.492	3.064	1.915	1.393
256.8	8.758	6.495	3.065	1.916	1.393
256.9	8.762	6.497	3.067	1.917	1.394
257.0	8.765	6.500	3.068	1.917	1.394
257.1	8.769	6.502	3.069	1.918	1.395
257.2	8.772	6.505	3.070	1.919	1.396
257.3	8.775	6.507	3.071	1.920	1.396
257.4	8.779	6.510	3.073	1.920	1.397
257.5	8.782	6.513	3.074	1.921	1.397
257.6	8.786	6.515	3.075	1.922	1.398
257.7	8.789	6.518	3.076	1.923	1.398
257.8	8.793	6.520	3.077	1.923	1.399
257.9	8.796	6.523	3.078	1.924	1.399
258.0	8.799	6.525	3.080	1.925	1.400
258.1	8.803	6.528	3.081	1.926	1.400
258.2	8.806	6.530	3.082	1.926	1.401
258.3	8.810	6.533	3.083	1.927	1.401
258.4	8.813	6.535	3.084	1.928	1.402
258.5	8.816	6.538	3.086	1.929	1.403
258.6	8.820	6.540	3.087	1.929	1.403
258.7	8.823	6.543	3.088	1.930	1.404
258.8	8.827	6.545	3.089	1.931	1.404
258.9	8.830	6.548	3.090	1.932	1.405
259.0	8.833	6.550	3.092	1.932	1.405
259.1	8.837	6.553	3.093	1.933	1.406
259.2	8.840	6.556	3.094	1.934	1.406
259.3	8.844	6.558	3.095	1.934	1.407
259.4	8.847	6.561	3.096	1.935	1.407
259.5	8.851	6.563	3.098	1.936	1.408
259.6	8.854	6.566	3.099	1.937	1.409
259.7	8.857	6.568	3.100	1.937	1.409
259.8	8.861	6.571	3.101	1.938	1.410
259.9	8.864	6.573	3.102	1.939	1.410

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
260.0	8.868	6.576	3.104	1.940	1.411
260.1	8.871	6.578	3.105	1.940	1.411
260.2	8.874	6.581	3.106	1.941	1.412
260.3	8.878	6.583	3.107	1.942	1.412
260.4	8.881	6.586	3.108	1.943	1.413
260.5	8.885	6.588	3.110	1.943	1.413
260.6	8.888	6.591	3.111	1.944	1.414
260.7	8.891	6.593	3.112	1.945	1.414
260.8	8.895	6.596	3.113	1.946	1.415
260.9	8.898	6.599	3.114	1.946	1.416
261.0	8.902	6.601	3.115	1.947	1.416
261.1	8.905	6.604	3.117	1.948	1.417
261.2	8.908	6.606	3.118	1.949	1.417
261.3	8.912	6.609	3.119	1.949	1.418
261.4	8.915	6.611	3.120	1.950	1.418
261.5	8.919	6.614	3.121	1.951	1.419
261.6	8.922	6.616	3.123	1.952	1.419
261.7	8.926	6.619	3.124	1.952	1.420
261.8	8.929	6.621	3.125	1.953	1.420
261.9	8.932	6.624	3.126	1.954	1.421
262.0	8.936	6.626	3.127	1.955	1.422
262.1	8.939	6.629	3.129	1.955	1.422
262.2	8.943	6.631	3.130	1.956	1.423
262.3	8.946	6.634	3.131	1.957	1.423
262.4	8.949	6.636	3.132	1.958	1.424
262.5	8.953	6.639	3.133	1.958	1.424
262.6	8.956	6.642	3.135	1.959	1.425
262.7	8.960	6.644	3.136	1.960	1.425
262.8	8.963	6.647	3.137	1.961	1.426
262.9	8.966	6.649	3.138	1.961	1.426
263.0	8.970	6.652	3.139	1.962	1.427
263.1	8.973	6.654	3.141	1.963	1.428
263.2	8.977	6.657	3.142	1.964	1.428
263.3	8.980	6.659	3.143	1.964	1.429
263.4	8.984	6.662	3.144	1.965	1.429
263.5	8.987	6.664	3.145	1.966	1.430
263.6	8.990	6.667	3.147	1.967	1.430
263.7	8.994	6.669	3.148	1.967	1.431
263.8	8.997	6.672	3.149	1.968	1.431
263.9	9.001	6.674	3.150	1.969	1.432
264.0	9.004	6.677	3.151	1.970	1.432
264.1	9.007	6.679	3.152	1.970	1.433
264.2	9.011	6.682	3.154	1.971	1.433
264.3	9.014	6.685	3.155	1.972	1.434
264.4	9.018	6.687	3.156	1.973	1.435
264.5	9.021	6.690	3.157	1.973	1.435
264.6	9.024	6.692	3.158	1.974	1.436
264.7	9.028	6.695	3.160	1.975	1.436
264.8	9.031	6.697	3.161	1.976	1.437
264.9	9.035	6.700	3.162	1.976	1.437

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
265.0	9.038	6.702	3.163	1.977	1.438
265.1	9.042	6.705	3.164	1.978	1.438
265.2	9.045	6.707	3.166	1.979	1.439
265.3	9.048	6.710	3.167	1.979	1.439
265.4	9.052	6.712	3.168	1.980	1.440
265.5	9.055	6.715	3.169	1.981	1.441
265.6	9.059	6.717	3.170	1.981	1.441
265.7	9.062	6.720	3.172	1.982	1.442
265.8	9.065	6.722	3.173	1.983	1.442
265.9	9.069	6.725	3.174	1.984	1.443
266.0	9.072	6.727	3.175	1.984	1.443
266.1	9.076	6.730	3.176	1.985	1.444
266.2	9.079	6.733	3.178	1.986	1.444
266.3	9.082	6.735	3.179	1.987	1.445
266.4	9.086	6.738	3.180	1.987	1.445
266.5	9.089	6.740	3.181	1.988	1.446
266.6	9.093	6.743	3.182	1.989	1.447
266.7	9.096	6.745	3.184	1.990	1.447
266.8	9.099	6.748	3.185	1.990	1.448
266.9	9.103	6.750	3.186	1.991	1.448
267.0	9.106	6.753	3.187	1.992	1.449
267.1	9.110	6.755	3.188	1.993	1.449
267.2	9.113	6.758	3.189	1.993	1.450
267.3	9.117	6.760	3.191	1.994	1.450
267.4	9.120	6.763	3.192	1.995	1.451
267.5	9.123	6.765	3.193	1.996	1.451
267.6	9.127	6.768	3.194	1.996	1.452
267.7	9.130	6.770	3.195	1.997	1.452
267.8	9.134	6.773	3.197	1.998	1.453
267.9	9.137	6.776	3.198	1.999	1.454
268.0	9.140	6.778	3.199	1.999	1.454
268.1	9.144	6.781	3.200	2.000	1.455
268.2	9.147	6.783	3.201	2.001	1.455
268.3	9.151	6.786	3.203	2.002	1.456
268.4	9.154	6.788	3.204	2.002	1.456
268.5	9.157	6.791	3.205	2.003	1.457
268.6	9.161	6.793	3.206	2.004	1.457
268.7	9.164	6.796	3.207	2.005	1.458
268.8	9.168	6.798	3.209	2.005	1.458
268.9	9.171	6.801	3.210	2.006	1.459
269.0	9.175	6.803	3.211	2.007	1.460
269.1	9.178	6.806	3.212	2.008	1.460
269.2	9.181	6.808	3.213	2.008	1.461
269.3	9.185	6.811	3.215	2.009	1.461
269.4	9.188	6.813	3.216	2.010	1.462
269.5	9.192	6.816	3.217	2.011	1.462
269.6	9.195	6.819	3.218	2.011	1.463
269.7	9.198	6.821	3.219	2.012	1.463
269.8	9.202	6.824	3.221	2.013	1.464
269.9	9.205	6.826	3.222	2.014	1.464

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
270.0	9.209	6.829	3.223	2.014	1.465
270.1	9.212	6.831	3.224	2.015	1.465
270.2	9.215	6.834	3.225	2.016	1.466
270.3	9.219	6.836	3.226	2.017	1.467
270.4	9.222	6.839	3.228	2.017	1.467
270.5	9.226	6.841	3.229	2.018	1.468
270.6	9.229	6.844	3.230	2.019	1.468
270.7	9.233	6.846	3.231	2.020	1.469
270.8	9.236	6.849	3.232	2.020	1.469
270.9	9.239	6.851	3.234	2.021	1.470
271.0	9.243	6.854	3.235	2.022	1.470
271.1	9.246	6.856	3.236	2.023	1.471
271.2	9.250	6.859	3.237	2.023	1.471
271.3	9.253	6.862	3.238	2.024	1.472
271.4	9.256	6.864	3.240	2.025	1.473
271.5	9.260	6.867	3.241	2.026	1.473
271.6	9.263	6.869	3.242	2.026	1.474
271.7	9.267	6.872	3.243	2.027	1.474
271.8	9.270	6.874	3.244	2.028	1.475
271.9	9.273	6.877	3.246	2.028	1.475
272.0	9.277	6.879	3.247	2.029	1.476
272.1	9.280	6.882	3.248	2.030	1.476
272.2	9.284	6.884	3.249	2.031	1.477
272.3	9.287	6.887	3.250	2.031	1.477
272.4	9.290	6.889	3.252	2.032	1.478
272.5	9.294	6.892	3.253	2.033	1.479
272.6	9.297	6.894	3.254	2.034	1.479
272.7	9.301	6.897	3.255	2.034	1.480
272.8	9.304	6.899	3.256	2.035	1.480
272.9	9.308	6.902	3.258	2.036	1.481
273.0	9.311	6.905	3.259	2.037	1.481
273.1	9.314	6.907	3.260	2.037	1.482
273.2	9.318	6.910	3.261	2.038	1.482
273.3	9.321	6.912	3.262	2.039	1.483
273.4	9.325	6.915	3.263	2.040	1.483
273.5	9.328	6.917	3.265	2.040	1.484
273.6	9.331	6.920	3.266	2.041	1.484
273.7	9.335	6.922	3.267	2.042	1.485
273.8	9.338	6.925	3.268	2.043	1.486
273.9	9.342	6.927	3.269	2.043	1.486
274.0	9.345	6.930	3.271	2.044	1.487
274.1	9.348	6.932	3.272	2.045	1.487
274.2	9.352	6.935	3.273	2.046	1.488
274.3	9.355	6.937	3.274	2.046	1.488
274.4	9.359	6.940	3.275	2.047	1.489
274.5	9.362	6.942	3.277	2.048	1.489
274.6	9.366	6.945	3.278	2.049	1.490
274.7	9.369	6.948	3.279	2.049	1.490
274.8	9.372	6.950	3.280	2.050	1.491
274.9	9.376	6.953	3.281	2.051	1.492

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
275.0	9.379	6.955	3.283	2.052	1.492
275.1	9.383	6.958	3.284	2.052	1.493
275.2	9.386	6.960	3.285	2.053	1.493
275.3	9.389	6.963	3.286	2.054	1.494
275.4	9.393	6.965	3.287	2.055	1.494
275.5	9.396	6.968	3.289	2.055	1.495
275.6	9.400	6.970	3.290	2.056	1.495
275.7	9.403	6.973	3.291	2.057	1.496
275.8	9.406	6.975	3.292	2.058	1.496
275.9	9.410	6.978	3.293	2.058	1.497
276.0	9.413	6.980	3.295	2.059	1.498
276.1	9.417	6.983	3.296	2.060	1.498
276.2	9.420	6.985	3.297	2.061	1.499
276.3	9.424	6.988	3.298	2.061	1.499
276.4	9.427	6.991	3.299	2.062	1.500
276.5	9.430	6.993	3.300	2.063	1.500
276.6	9.434	6.996	3.302	2.064	1.501
276.7	9.437	6.998	3.303	2.064	1.501
276.8	9.441	7.001	3.304	2.065	1.502
276.9	9.444	7.003	3.305	2.066	1.502
277.0	9.447	7.006	3.306	2.067	1.503
277.1	9.451	7.008	3.308	2.067	1.503
277.2	9.454	7.011	3.309	2.068	1.504
277.3	9.458	7.013	3.310	2.069	1.505
277.4	9.461	7.016	3.311	2.070	1.505
277.5	9.464	7.018	3.312	2.070	1.506
277.6	9.468	7.021	3.314	2.071	1.506
277.7	9.471	7.023	3.315	2.072	1.507
277.8	9.475	7.026	3.316	2.073	1.507
277.9	9.478	7.028	3.317	2.073	1.508
278.0	9.481	7.031	3.318	2.074	1.508
278.1	9.485	7.034	3.320	2.075	1.509
278.2	9.488	7.036	3.321	2.075	1.509
278.3	9.492	7.039	3.322	2.076	1.510
278.4	9.495	7.041	3.323	2.077	1.511
278.5	9.499	7.044	3.324	2.078	1.511
278.6	9.502	7.046	3.326	2.078	1.512
278.7	9.505	7.049	3.327	2.079	1.512
278.8	9.509	7.051	3.328	2.080	1.513
278.9	9.512	7.054	3.329	2.081	1.513
279.0	9.516	7.056	3.330	2.081	1.514
279.1	9.519	7.059	3.332	2.082	1.514
279.2	9.522	7.061	3.333	2.083	1.515
279.3	9.526	7.064	3.334	2.084	1.515
279.4	9.529	7.066	3.335	2.084	1.516
279.5	9.533	7.069	3.336	2.085	1.516
279.6	9.536	7.071	3.337	2.086	1.517
279.7	9.539	7.074	3.339	2.087	1.518
279.8	9.543	7.077	3.340	2.087	1.518
279.9	9.546	7.079	3.341	2.088	1.519

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
280.0	9.550	7.082	3.342	2.089	1.519
280.1	9.553	7.084	3.343	2.090	1.520
280.2	9.557	7.087	3.345	2.090	1.520
280.3	9.560	7.089	3.346	2.091	1.521
280.4	9.563	7.092	3.347	2.092	1.521
280.5	9.567	7.094	3.348	2.093	1.522
280.6	9.570	7.097	3.349	2.093	1.522
280.7	9.574	7.099	3.351	2.094	1.523
280.8	9.577	7.102	3.352	2.095	1.524
280.9	9.580	7.104	3.353	2.096	1.524
281.0	9.584	7.107	3.354	2.096	1.525
281.1	9.587	7.109	3.355	2.097	1.525
281.2	9.591	7.112	3.357	2.098	1.526
281.3	9.594	7.114	3.358	2.099	1.526
281.4	9.597	7.117	3.359	2.099	1.527
281.5	9.601	7.120	3.360	2.100	1.527
281.6	9.604	7.122	3.361	2.101	1.528
281.7	9.608	7.125	3.363	2.102	1.528
281.8	9.611	7.127	3.364	2.102	1.529
281.9	9.614	7.130	3.365	2.103	1.530
282.0	9.618	7.132	3.366	2.104	1.530
282.1	9.621	7.135	3.367	2.105	1.531
282.2	9.625	7.137	3.369	2.105	1.531
282.3	9.628	7.140	3.370	2.106	1.532
282.4	9.632	7.142	3.371	2.107	1.532
282.5	9.635	7.145	3.372	2.108	1.533
282.6	9.638	7.147	3.373	2.108	1.533
282.7	9.642	7.150	3.375	2.109	1.534
282.8	9.645	7.152	3.376	2.110	1.534
282.9	9.649	7.155	3.377	2.111	1.535
283.0	9.652	7.157	3.378	2.111	1.535
283.1	9.655	7.160	3.379	2.112	1.536
283.2	9.659	7.163	3.380	2.113	1.537
283.3	9.662	7.165	3.382	2.114	1.537
283.4	9.666	7.168	3.383	2.114	1.538
283.5	9.669	7.170	3.384	2.115	1.538
283.6	9.672	7.173	3.385	2.116	1.539
283.7	9.676	7.175	3.386	2.117	1.539
283.8	9.679	7.178	3.388	2.117	1.540
283.9	9.683	7.180	3.389	2.118	1.540
284.0	9.686	7.183	3.390	2.119	1.541
284.1	9.690	7.185	3.391	2.120	1.541
284.2	9.693	7.188	3.392	2.120	1.542
284.3	9.696	7.190	3.394	2.121	1.543
284.4	9.700	7.193	3.395	2.122	1.543
284.5	9.703	7.195	3.396	2.122	1.544
284.6	9.707	7.198	3.397	2.123	1.544
284.7	9.710	7.200	3.398	2.124	1.545
284.8	9.713	7.203	3.400	2.125	1.545
284.9	9.717	7.206	3.401	2.125	1.546

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
285.0	9.720	7.208	3.402	2.126	1.546
285.1	9.724	7.211	3.403	2.127	1.547
285.2	9.727	7.213	3.404	2.128	1.547
285.3	9.730	7.216	3.406	2.128	1.548
285.4	9.734	7.218	3.407	2.129	1.549
285.5	9.737	7.221	3.408	2.130	1.549
285.6	9.741	7.223	3.409	2.131	1.550
285.7	9.744	7.226	3.410	2.131	1.550
285.8	9.748	7.228	3.412	2.132	1.551
285.9	9.751	7.231	3.413	2.133	1.551
286.0	9.754	7.233	3.414	2.134	1.552
286.1	9.758	7.236	3.415	2.134	1.552
286.2	9.761	7.238	3.416	2.135	1.553
286.3	9.765	7.241	3.417	2.136	1.553
286.4	9.768	7.243	3.419	2.137	1.554
286.5	9.771	7.246	3.420	2.137	1.554
286.6	9.775	7.249	3.421	2.138	1.555
286.7	9.778	7.251	3.422	2.139	1.556
286.8	9.782	7.254	3.423	2.140	1.556
286.9	9.785	7.256	3.425	2.140	1.557
287.0	9.788	7.259	3.426	2.141	1.557
287.1	9.792	7.261	3.427	2.142	1.558
287.2	9.795	7.264	3.428	2.143	1.558
287.3	9.799	7.266	3.429	2.143	1.559
287.4	9.802	7.269	3.431	2.144	1.559
287.5	9.805	7.271	3.432	2.145	1.560
287.6	9.809	7.274	3.433	2.146	1.560
287.7	9.812	7.276	3.434	2.146	1.561
287.8	9.816	7.279	3.435	2.147	1.562
287.9	9.819	7.281	3.437	2.148	1.562
288.0	9.823	7.284	3.438	2.149	1.563
288.1	9.826	7.286	3.439	2.149	1.563
288.2	9.829	7.289	3.440	2.150	1.564
288.3	9.833	7.291	3.441	2.151	1.564
288.4	9.836	7.294	3.443	2.152	1.565
288.5	9.840	7.297	3.444	2.152	1.565
288.6	9.843	7.299	3.445	2.153	1.566
288.7	9.846	7.302	3.446	2.154	1.566
288.8	9.850	7.304	3.447	2.155	1.567
288.9	9.853	7.307	3.449	2.155	1.568
289.0	9.857	7.309	3.450	2.156	1.568
289.1	9.860	7.312	3.451	2.157	1.569
289.2	9.863	7.314	3.452	2.158	1.569
289.3	9.867	7.317	3.453	2.158	1.570
289.4	9.870	7.319	3.454	2.159	1.570
289.5	9.874	7.322	3.456	2.160	1.571
289.6	9.877	7.324	3.457	2.161	1.571
289.7	9.881	7.327	3.458	2.161	1.572
289.8	9.884	7.329	3.459	2.162	1.572
289.9	9.887	7.332	3.460	2.163	1.573

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
290.0	9.891	7.334	3.462	2.164	1.573
290.1	9.894	7.337	3.463	2.164	1.574
290.2	9.898	7.340	3.464	2.165	1.575
290.3	9.901	7.342	3.465	2.166	1.575
290.4	9.904	7.345	3.466	2.167	1.576
290.5	9.908	7.347	3.468	2.167	1.576
290.6	9.911	7.350	3.469	2.168	1.577
290.7	9.915	7.352	3.470	2.169	1.577
290.8	9.918	7.355	3.471	2.169	1.578
290.9	9.921	7.357	3.472	2.170	1.578
291.0	9.925	7.360	3.474	2.171	1.579
291.1	9.928	7.362	3.475	2.172	1.579
291.2	9.932	7.365	3.476	2.172	1.580
291.3	9.935	7.367	3.477	2.173	1.581
291.4	9.939	7.370	3.478	2.174	1.581
291.5	9.942	7.372	3.480	2.175	1.582
291.6	9.945	7.375	3.481	2.175	1.582
291.7	9.949	7.377	3.482	2.176	1.583
291.8	9.952	7.380	3.483	2.177	1.583
291.9	9.956	7.383	3.484	2.178	1.584
292.0	9.959	7.385	3.486	2.178	1.584
292.1	9.962	7.388	3.487	2.179	1.585
292.2	9.966	7.390	3.488	2.180	1.585
292.3	9.969	7.393	3.489	2.181	1.586
292.4	9.973	7.395	3.490	2.181	1.586
292.5	9.976	7.398	3.491	2.182	1.587
292.6	9.979	7.400	3.493	2.183	1.588
292.7	9.983	7.403	3.494	2.184	1.588
292.8	9.986	7.405	3.495	2.184	1.589
292.9	9.990	7.408	3.496	2.185	1.589
293.0	9.993	7.410	3.497	2.186	1.590
293.1	9.996	7.413	3.499	2.187	1.590
293.2	10.000	7.415	3.500	2.187	1.591
293.3	10.003	7.418	3.501	2.188	1.591
293.4	10.007	7.420	3.502	2.189	1.592
293.5	10.010	7.423	3.503	2.190	1.592
293.6	10.014	7.426	3.505	2.190	1.593
293.7	10.017	7.428	3.506	2.191	1.594
293.8	10.020	7.431	3.507	2.192	1.594
293.9	10.024	7.433	3.508	2.193	1.595
294.0	10.027	7.436	3.509	2.193	1.595
294.1	10.031	7.438	3.511	2.194	1.596
294.2	10.034	7.441	3.512	2.195	1.596
294.3	10.037	7.443	3.513	2.196	1.597
294.4	10.041	7.446	3.514	2.196	1.597
294.5	10.044	7.448	3.515	2.197	1.598
294.6	10.048	7.451	3.517	2.198	1.598
294.7	10.051	7.453	3.518	2.199	1.599
294.8	10.054	7.456	3.519	2.199	1.600
294.9	10.058	7.458	3.520	2.200	1.600

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
295.0	10.061	7.461	3.521	2.201	1.601
295.1	10.065	7.463	3.523	2.202	1.601
295.2	10.068	7.466	3.524	2.202	1.602
295.3	10.072	7.469	3.525	2.203	1.602
295.4	10.075	7.471	3.526	2.204	1.603
295.5	10.078	7.474	3.527	2.205	1.603
295.6	10.082	7.476	3.528	2.205	1.604
295.7	10.085	7.479	3.530	2.206	1.604
295.8	10.089	7.481	3.531	2.207	1.605
295.9	10.092	7.484	3.532	2.208	1.605
296.0	10.095	7.486	3.533	2.208	1.606
296.1	10.099	7.489	3.534	2.209	1.607
296.2	10.102	7.491	3.536	2.210	1.607
296.3	10.106	7.494	3.537	2.211	1.608
296.4	10.109	7.496	3.538	2.211	1.608
296.5	10.112	7.499	3.539	2.212	1.609
296.6	10.116	7.501	3.540	2.213	1.609
296.7	10.119	7.504	3.542	2.214	1.610
296.8	10.123	7.506	3.543	2.214	1.610
296.9	10.126	7.509	3.544	2.215	1.611
297.0	10.129	7.512	3.545	2.216	1.611
297.1	10.133	7.514	3.546	2.216	1.612
297.2	10.136	7.517	3.548	2.217	1.613
297.3	10.140	7.519	3.549	2.218	1.613
297.4	10.143	7.522	3.550	2.219	1.614
297.5	10.147	7.524	3.551	2.219	1.614
297.6	10.150	7.527	3.552	2.220	1.615
297.7	10.153	7.529	3.554	2.221	1.615
297.8	10.157	7.532	3.555	2.222	1.616
297.9	10.160	7.534	3.556	2.222	1.616
298.0	10.164	7.537	3.557	2.223	1.617
298.1	10.167	7.539	3.558	2.224	1.617
298.2	10.170	7.542	3.560	2.225	1.618
298.3	10.174	7.544	3.561	2.225	1.619
298.4	10.177	7.547	3.562	2.226	1.619
298.5	10.181	7.549	3.563	2.227	1.620
298.6	10.184	7.552	3.564	2.228	1.620
298.7	10.187	7.555	3.565	2.228	1.621
298.8	10.191	7.557	3.567	2.229	1.621
298.9	10.194	7.560	3.568	2.230	1.622
299.0	10.198	7.562	3.569	2.231	1.622
299.1	10.201	7.565	3.570	2.231	1.623
299.2	10.205	7.567	3.571	2.232	1.623
299.3	10.208	7.570	3.573	2.233	1.624
299.4	10.211	7.572	3.574	2.234	1.624
299.5	10.215	7.575	3.575	2.234	1.625
299.6	10.218	7.577	3.576	2.235	1.626
299.7	10.222	7.580	3.577	2.236	1.626
299.8	10.225	7.582	3.579	2.237	1.627
299.9	10.228	7.585	3.580	2.237	1.627

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
300.0	10.232	7.587	3.581	2.238	1.628
300.1	10.235	7.590	3.582	2.239	1.628
300.2	10.239	7.592	3.583	2.240	1.629
300.3	10.242	7.595	3.585	2.240	1.629
300.4	10.245	7.598	3.586	2.241	1.630
300.5	10.249	7.600	3.587	2.242	1.630
300.6	10.252	7.603	3.588	2.243	1.631
300.7	10.256	7.605	3.589	2.243	1.632
300.8	10.259	7.608	3.591	2.244	1.632
300.9	10.263	7.610	3.592	2.245	1.633
301.0	10.266	7.613	3.593	2.246	1.633
301.1	10.269	7.615	3.594	2.246	1.634
301.2	10.273	7.618	3.595	2.247	1.634
301.3	10.276	7.620	3.597	2.248	1.635
301.4	10.280	7.623	3.598	2.249	1.635
301.5	10.283	7.625	3.599	2.249	1.636
301.6	10.286	7.628	3.600	2.250	1.636
301.7	10.290	7.630	3.601	2.251	1.637
301.8	10.293	7.633	3.602	2.252	1.637
301.9	10.297	7.635	3.604	2.252	1.638
302.0	10.300	7.638	3.605	2.253	1.639
302.1	10.303	7.641	3.606	2.254	1.639
302.2	10.307	7.643	3.607	2.255	1.640
302.3	10.310	7.646	3.608	2.255	1.640
302.4	10.314	7.648	3.610	2.256	1.641
302.5	10.317	7.651	3.611	2.257	1.641
302.6	10.320	7.653	3.612	2.258	1.642
302.7	10.324	7.656	3.613	2.258	1.642
302.8	10.327	7.658	3.614	2.259	1.643
302.9	10.331	7.661	3.616	2.260	1.643
303.0	10.334	7.663	3.617	2.261	1.644
303.1	10.338	7.666	3.618	2.261	1.645
303.2	10.341	7.668	3.619	2.262	1.645
303.3	10.344	7.671	3.620	2.263	1.646
303.4	10.348	7.673	3.622	2.263	1.646
303.5	10.351	7.676	3.623	2.264	1.647
303.6	10.355	7.678	3.624	2.265	1.647
303.7	10.358	7.681	3.625	2.266	1.648
303.8	10.361	7.684	3.626	2.266	1.648
303.9	10.365	7.686	3.628	2.267	1.649
304.0	10.368	7.689	3.629	2.268	1.649
304.1	10.372	7.691	3.630	2.269	1.650
304.2	10.375	7.694	3.631	2.269	1.651
304.3	10.378	7.696	3.632	2.270	1.651
304.4	10.382	7.699	3.634	2.271	1.652
304.5	10.385	7.701	3.635	2.272	1.652
304.6	10.389	7.704	3.636	2.272	1.653
304.7	10.392	7.706	3.637	2.273	1.653
304.8	10.396	7.709	3.638	2.274	1.654
304.9	10.399	7.711	3.639	2.275	1.654

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
305.0	10.402	7.714	3.641	2.275	1.655
305.1	10.406	7.716	3.642	2.276	1.655
305.2	10.409	7.719	3.643	2.277	1.656
305.3	10.413	7.721	3.644	2.278	1.656
305.4	10.416	7.724	3.645	2.278	1.657
305.5	10.419	7.727	3.647	2.279	1.658
305.6	10.423	7.729	3.648	2.280	1.658
305.7	10.426	7.732	3.649	2.281	1.659
305.8	10.430	7.734	3.650	2.281	1.659
305.9	10.433	7.737	3.651	2.282	1.660
306.0	10.436	7.739	3.653	2.283	1.660
306.1	10.440	7.742	3.654	2.284	1.661
306.2	10.443	7.744	3.655	2.284	1.661
306.3	10.447	7.747	3.656	2.285	1.662
306.4	10.450	7.749	3.657	2.286	1.662
306.5	10.454	7.752	3.659	2.287	1.663
306.6	10.457	7.754	3.660	2.287	1.664
306.7	10.460	7.757	3.661	2.288	1.664
306.8	10.464	7.759	3.662	2.289	1.665
306.9	10.467	7.762	3.663	2.290	1.665
307.0	10.471	7.764	3.665	2.290	1.666
307.1	10.474	7.767	3.666	2.291	1.666
307.2	10.477	7.770	3.667	2.292	1.667
307.3	10.481	7.772	3.668	2.293	1.667
307.4	10.484	7.775	3.669	2.293	1.668
307.5	10.488	7.777	3.671	2.294	1.668
307.6	10.491	7.780	3.672	2.295	1.669
307.7	10.494	7.782	3.673	2.296	1.670
307.8	10.498	7.785	3.674	2.296	1.670
307.9	10.501	7.787	3.675	2.297	1.671
308.0	10.505	7.790	3.676	2.298	1.671
308.1	10.508	7.792	3.678	2.299	1.672
308.2	10.511	7.795	3.679	2.299	1.672
308.3	10.515	7.797	3.680	2.300	1.673
308.4	10.518	7.800	3.681	2.301	1.673
308.5	10.522	7.802	3.682	2.302	1.674
308.6	10.525	7.805	3.684	2.302	1.674
308.7	10.529	7.807	3.685	2.303	1.675
308.8	10.532	7.810	3.686	2.304	1.675
308.9	10.535	7.812	3.687	2.305	1.676
309.0	10.539	7.815	3.688	2.305	1.677
309.1	10.542	7.818	3.690	2.306	1.677
309.2	10.546	7.820	3.691	2.307	1.678
309.3	10.549	7.823	3.692	2.308	1.678
309.4	10.552	7.825	3.693	2.308	1.679
309.5	10.556	7.828	3.694	2.309	1.679
309.6	10.559	7.830	3.696	2.310	1.680
309.7	10.563	7.833	3.697	2.310	1.680
309.8	10.566	7.835	3.698	2.311	1.681
309.9	10.569	7.838	3.699	2.312	1.681

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
310.0	10.573	7.840	3.700	2.313	1.682
310.1	10.576	7.843	3.702	2.313	1.683
310.2	10.580	7.845	3.703	2.314	1.683
310.3	10.583	7.848	3.704	2.315	1.684
310.4	10.587	7.850	3.705	2.316	1.684
310.5	10.590	7.853	3.706	2.316	1.685
310.6	10.593	7.855	3.708	2.317	1.685
310.7	10.597	7.858	3.709	2.318	1.686
310.8	10.600	7.861	3.710	2.319	1.686
310.9	10.604	7.863	3.711	2.319	1.687
311.0	10.607	7.866	3.712	2.320	1.687
311.1	10.610	7.868	3.714	2.321	1.688
311.2	10.614	7.871	3.715	2.322	1.688
311.3	10.617	7.873	3.716	2.322	1.689
311.4	10.621	7.876	3.717	2.323	1.690
311.5	10.624	7.878	3.718	2.324	1.690
311.6	10.627	7.881	3.719	2.325	1.691
311.7	10.631	7.883	3.721	2.325	1.691
311.8	10.634	7.886	3.722	2.326	1.692
311.9	10.638	7.888	3.723	2.327	1.692
312.0	10.641	7.891	3.724	2.328	1.693
312.1	10.644	7.893	3.725	2.328	1.693
312.2	10.648	7.896	3.727	2.329	1.694
312.3	10.651	7.898	3.728	2.330	1.694
312.4	10.655	7.901	3.729	2.331	1.695
312.5	10.658	7.904	3.730	2.331	1.696
312.6	10.662	7.906	3.731	2.332	1.696
312.7	10.665	7.909	3.733	2.333	1.697
312.8	10.668	7.911	3.734	2.334	1.697
312.9	10.672	7.914	3.735	2.334	1.698
313.0	10.675	7.916	3.736	2.335	1.698
313.1	10.679	7.919	3.737	2.336	1.699
313.2	10.682	7.921	3.739	2.337	1.699
313.3	10.685	7.924	3.740	2.337	1.700
313.4	10.689	7.926	3.741	2.338	1.700
313.5	10.692	7.929	3.742	2.339	1.701
313.6	10.696	7.931	3.743	2.340	1.702
313.7	10.699	7.934	3.745	2.340	1.702
313.8	10.702	7.936	3.746	2.341	1.703
313.9	10.706	7.939	3.747	2.342	1.703
314.0	10.709	7.941	3.748	2.343	1.704
314.1	10.713	7.944	3.749	2.343	1.704
314.2	10.716	7.947	3.751	2.344	1.705
314.3	10.720	7.949	3.752	2.345	1.705
314.4	10.723	7.952	3.753	2.346	1.706
314.5	10.726	7.954	3.754	2.346	1.706
314.6	10.730	7.957	3.755	2.347	1.707
314.7	10.733	7.959	3.756	2.348	1.707
314.8	10.737	7.962	3.758	2.349	1.708
314.9	10.740	7.964	3.759	2.349	1.709

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
315.0	10.743	7.967	3.760	2.350	1.709
315.1	10.747	7.969	3.761	2.351	1.710
315.2	10.750	7.972	3.762	2.352	1.710
315.3	10.754	7.974	3.764	2.352	1.711
315.4	10.757	7.977	3.765	2.353	1.711
315.5	10.760	7.979	3.766	2.354	1.712
315.6	10.764	7.982	3.767	2.355	1.712
315.7	10.767	7.984	3.768	2.355	1.713
315.8	10.771	7.987	3.770	2.356	1.713
315.9	10.774	7.990	3.771	2.357	1.714
316.0	10.778	7.992	3.772	2.358	1.715
316.1	10.781	7.995	3.773	2.358	1.715
316.2	10.784	7.997	3.774	2.359	1.716
316.3	10.788	8.000	3.776	2.360	1.716
316.4	10.791	8.002	3.777	2.360	1.717
316.5	10.795	8.005	3.778	2.361	1.717
316.6	10.798	8.007	3.779	2.362	1.718
316.7	10.801	8.010	3.780	2.363	1.718
316.8	10.805	8.012	3.782	2.363	1.719
316.9	10.808	8.015	3.783	2.364	1.719
317.0	10.812	8.017	3.784	2.365	1.720
317.1	10.815	8.020	3.785	2.366	1.721
317.2	10.818	8.022	3.786	2.366	1.721
317.3	10.822	8.025	3.788	2.367	1.722
317.4	10.825	8.027	3.789	2.368	1.722
317.5	10.829	8.030	3.790	2.369	1.723
317.6	10.832	8.033	3.791	2.369	1.723
317.7	10.835	8.035	3.792	2.370	1.724
317.8	10.839	8.038	3.793	2.371	1.724
317.9	10.842	8.040	3.795	2.372	1.725
318.0	10.846	8.043	3.796	2.372	1.725
318.1	10.849	8.045	3.797	2.373	1.726
318.2	10.853	8.048	3.798	2.374	1.726
318.3	10.856	8.050	3.799	2.375	1.727
318.4	10.859	8.053	3.801	2.375	1.728
318.5	10.863	8.055	3.802	2.376	1.728
318.6	10.866	8.058	3.803	2.377	1.729
318.7	10.870	8.060	3.804	2.378	1.729
318.8	10.873	8.063	3.805	2.378	1.730
318.9	10.876	8.065	3.807	2.379	1.730
319.0	10.880	8.068	3.808	2.380	1.731
319.1	10.883	8.070	3.809	2.381	1.731
319.2	10.887	8.073	3.810	2.381	1.732
319.3	10.890	8.076	3.811	2.382	1.732
319.4	10.893	8.078	3.813	2.383	1.733
319.5	10.897	8.081	3.814	2.384	1.734
319.6	10.900	8.083	3.815	2.384	1.734
319.7	10.904	8.086	3.816	2.385	1.735
319.8	10.907	8.088	3.817	2.386	1.735
319.9	10.911	8.091	3.819	2.387	1.736

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
320.0	10.914	8.093	3.820	2.387	1.736
320.1	10.917	8.096	3.821	2.388	1.737
320.2	10.921	8.098	3.822	2.389	1.737
320.3	10.924	8.101	3.823	2.390	1.738
320.4	10.928	8.103	3.825	2.390	1.738
320.5	10.931	8.106	3.826	2.391	1.739
320.6	10.934	8.108	3.827	2.392	1.739
320.7	10.938	8.111	3.828	2.393	1.740
320.8	10.941	8.113	3.829	2.393	1.741
320.9	10.945	8.116	3.830	2.394	1.741
321.0	10.948	8.119	3.832	2.395	1.742
321.1	10.951	8.121	3.833	2.396	1.742
321.2	10.955	8.124	3.834	2.396	1.743
321.3	10.958	8.126	3.835	2.397	1.743
321.4	10.962	8.129	3.836	2.398	1.744
321.5	10.965	8.131	3.838	2.399	1.744
321.6	10.969	8.134	3.839	2.399	1.745
321.7	10.972	8.136	3.840	2.400	1.745
321.8	10.975	8.139	3.841	2.401	1.746
321.9	10.979	8.141	3.842	2.402	1.747
322.0	10.982	8.144	3.844	2.402	1.747
322.1	10.986	8.146	3.845	2.403	1.748
322.2	10.989	8.149	3.846	2.404	1.748
322.3	10.992	8.151	3.847	2.405	1.749
322.4	10.996	8.154	3.848	2.405	1.749
322.5	10.999	8.156	3.850	2.406	1.750
322.6	11.003	8.159	3.851	2.407	1.750
322.7	11.006	8.162	3.852	2.407	1.751
322.8	11.009	8.164	3.853	2.408	1.751
322.9	11.013	8.167	3.854	2.409	1.752
323.0	11.016	8.169	3.856	2.410	1.753
323.1	11.020	8.172	3.857	2.410	1.753
323.2	11.023	8.174	3.858	2.411	1.754
323.3	11.026	8.177	3.859	2.412	1.754
323.4	11.030	8.179	3.860	2.413	1.755
323.5	11.033	8.182	3.862	2.413	1.755
323.6	11.037	8.184	3.863	2.414	1.756
323.7	11.040	8.187	3.864	2.415	1.756
323.8	11.044	8.189	3.865	2.416	1.757
323.9	11.047	8.192	3.866	2.416	1.757
324.0	11.050	8.194	3.867	2.417	1.758
324.1	11.054	8.197	3.869	2.418	1.758
324.2	11.057	8.199	3.870	2.419	1.759
324.3	11.061	8.202	3.871	2.419	1.760
324.4	11.064	8.205	3.872	2.420	1.760
324.5	11.067	8.207	3.873	2.421	1.761
324.6	11.071	8.210	3.875	2.422	1.761
324.7	11.074	8.212	3.876	2.422	1.762
324.8	11.078	8.215	3.877	2.423	1.762
324.9	11.081	8.217	3.878	2.424	1.763

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
325.0	11.084	8.220	3.879	2.425	1.763
325.1	11.088	8.222	3.881	2.425	1.764
325.2	11.091	8.225	3.882	2.426	1.764
325.3	11.095	8.227	3.883	2.427	1.765
325.4	11.098	8.230	3.884	2.428	1.766
325.5	11.102	8.232	3.885	2.428	1.766
325.6	11.105	8.235	3.887	2.429	1.767
325.7	11.108	8.237	3.888	2.430	1.767
325.8	11.112	8.240	3.889	2.431	1.768
325.9	11.115	8.242	3.890	2.431	1.768
326.0	11.119	8.245	3.891	2.432	1.769
326.1	11.122	8.248	3.893	2.433	1.769
326.2	11.125	8.250	3.894	2.434	1.770
326.3	11.129	8.253	3.895	2.434	1.770
326.4	11.132	8.255	3.896	2.435	1.771
326.5	11.136	8.258	3.897	2.436	1.772
326.6	11.139	8.260	3.899	2.437	1.772
326.7	11.142	8.263	3.900	2.437	1.773
326.8	11.146	8.265	3.901	2.438	1.773
326.9	11.149	8.268	3.902	2.439	1.774
327.0	11.153	8.270	3.903	2.440	1.774
327.1	11.156	8.273	3.904	2.440	1.775
327.2	11.159	8.275	3.906	2.441	1.775
327.3	11.163	8.278	3.907	2.442	1.776
327.4	11.166	8.280	3.908	2.443	1.776
327.5	11.170	8.283	3.909	2.443	1.777
327.6	11.173	8.285	3.910	2.444	1.777
327.7	11.177	8.288	3.912	2.445	1.778
327.8	11.180	8.291	3.913	2.446	1.779
327.9	11.183	8.293	3.914	2.446	1.779
328.0	11.187	8.296	3.915	2.447	1.780
328.1	11.190	8.298	3.916	2.448	1.780
328.2	11.194	8.301	3.918	2.449	1.781
328.3	11.197	8.303	3.919	2.449	1.781
328.4	11.200	8.306	3.920	2.450	1.782
328.5	11.204	8.308	3.921	2.451	1.782
328.6	11.207	8.311	3.922	2.452	1.783
328.7	11.211	8.313	3.924	2.452	1.783
328.8	11.214	8.316	3.925	2.453	1.784
328.9	11.217	8.318	3.926	2.454	1.785
329.0	11.221	8.321	3.927	2.454	1.785
329.1	11.224	8.323	3.928	2.455	1.786
329.2	11.228	8.326	3.930	2.456	1.786
329.3	11.231	8.328	3.931	2.457	1.787
329.4	11.235	8.331	3.932	2.457	1.787
329.5	11.238	8.334	3.933	2.458	1.788
329.6	11.241	8.336	3.934	2.459	1.788
329.7	11.245	8.339	3.936	2.460	1.789
329.8	11.248	8.341	3.937	2.460	1.789
329.9	11.252	8.344	3.938	2.461	1.790

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
330.0	11.255	8.346	3.939	2.462	1.791
330.1	11.258	8.349	3.940	2.463	1.791
330.2	11.262	8.351	3.941	2.463	1.792
330.3	11.265	8.354	3.943	2.464	1.792
330.4	11.269	8.356	3.944	2.465	1.793
330.5	11.272	8.359	3.945	2.466	1.793
330.6	11.275	8.361	3.946	2.466	1.794
330.7	11.279	8.364	3.947	2.467	1.794
330.8	11.282	8.366	3.949	2.468	1.795
330.9	11.286	8.369	3.950	2.469	1.795
331.0	11.289	8.371	3.951	2.469	1.796
331.1	11.293	8.374	3.952	2.470	1.796
331.2	11.296	8.376	3.953	2.471	1.797
331.3	11.299	8.379	3.955	2.472	1.798
331.4	11.303	8.382	3.956	2.472	1.798
331.5	11.306	8.384	3.957	2.473	1.799
331.6	11.310	8.387	3.958	2.474	1.799
331.7	11.313	8.389	3.959	2.475	1.800
331.8	11.316	8.392	3.961	2.475	1.800
331.9	11.320	8.394	3.962	2.476	1.801
332.0	11.323	8.397	3.963	2.477	1.801
332.1	11.327	8.399	3.964	2.478	1.802
332.2	11.330	8.402	3.965	2.478	1.802
332.3	11.333	8.404	3.967	2.479	1.803
332.4	11.337	8.407	3.968	2.480	1.804
332.5	11.340	8.409	3.969	2.481	1.804
332.6	11.344	8.412	3.970	2.481	1.805
332.7	11.347	8.414	3.971	2.482	1.805
332.8	11.350	8.417	3.973	2.483	1.806
332.9	11.354	8.419	3.974	2.484	1.806
333.0	11.357	8.422	3.975	2.484	1.807
333.1	11.361	8.425	3.976	2.485	1.807
333.2	11.364	8.427	3.977	2.486	1.808
333.3	11.368	8.430	3.978	2.487	1.808
333.4	11.371	8.432	3.980	2.487	1.809
333.5	11.374	8.435	3.981	2.488	1.809
333.6	11.378	8.437	3.982	2.489	1.810
333.7	11.381	8.440	3.983	2.490	1.811
333.8	11.385	8.442	3.984	2.490	1.811
333.9	11.388	8.445	3.986	2.491	1.812
334.0	11.391	8.447	3.987	2.492	1.812
334.1	11.395	8.450	3.988	2.493	1.813
334.2	11.398	8.452	3.989	2.493	1.813
334.3	11.402	8.455	3.990	2.494	1.814
334.4	11.405	8.457	3.992	2.495	1.814
334.5	11.408	8.460	3.993	2.496	1.815
334.6	11.412	8.462	3.994	2.496	1.815
334.7	11.415	8.465	3.995	2.497	1.816
334.8	11.419	8.468	3.996	2.498	1.817
334.9	11.422	8.470	3.998	2.499	1.817

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
335.0	11.426	8.473	3.999	2.499	1.818
335.1	11.429	8.475	4.000	2.500	1.818
335.2	11.432	8.478	4.001	2.501	1.819
335.3	11.436	8.480	4.002	2.501	1.819
335.4	11.439	8.483	4.004	2.502	1.820
335.5	11.443	8.485	4.005	2.503	1.820
335.6	11.446	8.488	4.006	2.504	1.821
335.7	11.449	8.490	4.007	2.504	1.821
335.8	11.453	8.493	4.008	2.505	1.822
335.9	11.456	8.495	4.010	2.506	1.823
336.0	11.460	8.498	4.011	2.507	1.823
336.1	11.463	8.500	4.012	2.507	1.824
336.2	11.466	8.503	4.013	2.508	1.824
336.3	11.470	8.505	4.014	2.509	1.825
336.4	11.473	8.508	4.016	2.510	1.825
336.5	11.477	8.511	4.017	2.510	1.826
336.6	11.480	8.513	4.018	2.511	1.826
336.7	11.484	8.516	4.019	2.512	1.827
336.8	11.487	8.518	4.020	2.513	1.827
336.9	11.490	8.521	4.021	2.513	1.828
337.0	11.494	8.523	4.023	2.514	1.828
337.1	11.497	8.526	4.024	2.515	1.829
337.2	11.501	8.528	4.025	2.516	1.830
337.3	11.504	8.531	4.026	2.516	1.830
337.4	11.507	8.533	4.027	2.517	1.831
337.5	11.511	8.536	4.029	2.518	1.831
337.6	11.514	8.538	4.030	2.519	1.832
337.7	11.518	8.541	4.031	2.519	1.832
337.8	11.521	8.543	4.032	2.520	1.833
337.9	11.524	8.546	4.033	2.521	1.833
338.0	11.528	8.548	4.035	2.522	1.834
338.1	11.531	8.551	4.036	2.522	1.834
338.2	11.535	8.554	4.037	2.523	1.835
338.3	11.538	8.556	4.038	2.524	1.836
338.4	11.541	8.559	4.039	2.525	1.836
338.5	11.545	8.561	4.041	2.525	1.837
338.6	11.548	8.564	4.042	2.526	1.837
338.7	11.552	8.566	4.043	2.527	1.838
338.8	11.555	8.569	4.044	2.528	1.838
338.9	11.559	8.571	4.045	2.528	1.839
339.0	11.562	8.574	4.047	2.529	1.839
339.1	11.565	8.576	4.048	2.530	1.840
339.2	11.569	8.579	4.049	2.531	1.840
339.3	11.572	8.581	4.050	2.531	1.841
339.4	11.576	8.584	4.051	2.532	1.842
339.5	11.579	8.586	4.053	2.533	1.842
339.6	11.582	8.589	4.054	2.534	1.843
339.7	11.586	8.591	4.055	2.534	1.843
339.8	11.589	8.594	4.056	2.535	1.844
339.9	11.593	8.597	4.057	2.536	1.844

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
340.0	11.596	8.599	4.058	2.537	1.845
340.1	11.599	8.602	4.060	2.537	1.845
340.2	11.603	8.604	4.061	2.538	1.846
340.3	11.606	8.607	4.062	2.539	1.846
340.4	11.610	8.609	4.063	2.540	1.847
340.5	11.613	8.612	4.064	2.540	1.847
340.6	11.617	8.614	4.066	2.541	1.848
340.7	11.620	8.617	4.067	2.542	1.849
340.8	11.623	8.619	4.068	2.543	1.849
340.9	11.627	8.622	4.069	2.543	1.850
341.0	11.630	8.624	4.070	2.544	1.850
341.1	11.634	8.627	4.072	2.545	1.851
341.2	11.637	8.629	4.073	2.546	1.851
341.3	11.640	8.632	4.074	2.546	1.852
341.4	11.644	8.634	4.075	2.547	1.852
341.5	11.647	8.637	4.076	2.548	1.853
341.6	11.651	8.640	4.078	2.548	1.853
341.7	11.654	8.642	4.079	2.549	1.854
341.8	11.657	8.645	4.080	2.550	1.855
341.9	11.661	8.647	4.081	2.551	1.855
342.0	11.664	8.650	4.082	2.551	1.856
342.1	11.668	8.652	4.084	2.552	1.856
342.2	11.671	8.655	4.085	2.553	1.857
342.3	11.674	8.657	4.086	2.554	1.857
342.4	11.678	8.660	4.087	2.554	1.858
342.5	11.681	8.662	4.088	2.555	1.858
342.6	11.685	8.665	4.090	2.556	1.859
342.7	11.688	8.667	4.091	2.557	1.859
342.8	11.692	8.670	4.092	2.557	1.860
342.9	11.695	8.672	4.093	2.558	1.860
343.0	11.698	8.675	4.094	2.559	1.861
343.1	11.702	8.677	4.095	2.560	1.862
343.2	11.705	8.680	4.097	2.560	1.862
343.3	11.709	8.683	4.098	2.561	1.863
343.4	11.712	8.685	4.099	2.562	1.863
343.5	11.715	8.688	4.100	2.563	1.864
343.6	11.719	8.690	4.101	2.563	1.864
343.7	11.722	8.693	4.103	2.564	1.865
343.8	11.726	8.695	4.104	2.565	1.865
343.9	11.729	8.698	4.105	2.566	1.866
344.0	11.732	8.700	4.106	2.566	1.866
344.1	11.736	8.703	4.107	2.567	1.867
344.2	11.739	8.705	4.109	2.568	1.868
344.3	11.743	8.708	4.110	2.569	1.868
344.4	11.746	8.710	4.111	2.569	1.869
344.5	11.750	8.713	4.112	2.570	1.869
344.6	11.753	8.715	4.113	2.571	1.870
344.7	11.756	8.718	4.115	2.572	1.870
344.8	11.760	8.720	4.116	2.572	1.871
344.9	11.763	8.723	4.117	2.573	1.871

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
345.0	11.767	8.726	4.118	2.574	1.872
345.1	11.770	8.728	4.119	2.575	1.872
345.2	11.773	8.731	4.121	2.575	1.873
345.3	11.777	8.733	4.122	2.576	1.874
345.4	11.780	8.736	4.123	2.577	1.874
345.5	11.784	8.738	4.124	2.578	1.875
345.6	11.787	8.741	4.125	2.578	1.875
345.7	11.790	8.743	4.127	2.579	1.876
345.8	11.794	8.746	4.128	2.580	1.876
345.9	11.797	8.748	4.129	2.581	1.877
346.0	11.801	8.751	4.130	2.581	1.877
346.1	11.804	8.753	4.131	2.582	1.878
346.2	11.808	8.756	4.132	2.583	1.878
346.3	11.811	8.758	4.134	2.584	1.879
346.4	11.814	8.761	4.135	2.584	1.879
346.5	11.818	8.763	4.136	2.585	1.880
346.6	11.821	8.766	4.137	2.586	1.881
346.7	11.825	8.769	4.138	2.587	1.881
346.8	11.828	8.771	4.140	2.587	1.882
346.9	11.831	8.774	4.141	2.588	1.882
347.0	11.835	8.776	4.142	2.589	1.883
347.1	11.838	8.779	4.143	2.590	1.883
347.2	11.842	8.781	4.144	2.590	1.884
347.3	11.845	8.784	4.146	2.591	1.884
347.4	11.848	8.786	4.147	2.592	1.885
347.5	11.852	8.789	4.148	2.593	1.885
347.6	11.855	8.791	4.149	2.593	1.886
347.7	11.859	8.794	4.150	2.594	1.887
347.8	11.862	8.796	4.152	2.595	1.887
347.9	11.865	8.799	4.153	2.595	1.888
348.0	11.869	8.801	4.154	2.596	1.888
348.1	11.872	8.804	4.155	2.597	1.889
348.2	11.876	8.806	4.156	2.598	1.889
348.3	11.879	8.809	4.158	2.598	1.890
348.4	11.883	8.812	4.159	2.599	1.890
348.5	11.886	8.814	4.160	2.600	1.891
348.6	11.889	8.817	4.161	2.601	1.891
348.7	11.893	8.819	4.162	2.601	1.892
348.8	11.896	8.822	4.164	2.602	1.893
348.9	11.900	8.824	4.165	2.603	1.893
349.0	11.903	8.827	4.166	2.604	1.894
349.1	11.906	8.829	4.167	2.604	1.894
349.2	11.910	8.832	4.168	2.605	1.895
349.3	11.913	8.834	4.169	2.606	1.895
349.4	11.917	8.837	4.171	2.607	1.896
349.5	11.920	8.839	4.172	2.607	1.896
349.6	11.923	8.842	4.173	2.608	1.897
349.7	11.927	8.844	4.174	2.609	1.897
349.8	11.930	8.847	4.175	2.610	1.898
349.9	11.934	8.849	4.177	2.610	1.898

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
350.0	11.937	8.852	4.178	2.611	1.899
350.1	11.941	8.855	4.179	2.612	1.900
350.2	11.944	8.857	4.180	2.613	1.900
350.3	11.947	8.860	4.181	2.613	1.901
350.4	11.951	8.862	4.183	2.614	1.901
350.5	11.954	8.865	4.184	2.615	1.902
350.6	11.958	8.867	4.185	2.616	1.902
350.7	11.961	8.870	4.186	2.616	1.903
350.8	11.964	8.872	4.187	2.617	1.903
350.9	11.968	8.875	4.189	2.618	1.904
351.0	11.971	8.877	4.190	2.619	1.904
351.1	11.975	8.880	4.191	2.619	1.905
351.2	11.978	8.882	4.192	2.620	1.906
351.3	11.981	8.885	4.193	2.621	1.906
351.4	11.985	8.887	4.195	2.622	1.907
351.5	11.988	8.890	4.196	2.622	1.907
351.6	11.992	8.892	4.197	2.623	1.908
351.7	11.995	8.895	4.198	2.624	1.908
351.8	11.999	8.897	4.199	2.625	1.909
351.9	12.002	8.900	4.201	2.625	1.909
352.0	12.005	8.903	4.202	2.626	1.910
352.1	12.009	8.905	4.203	2.627	1.910
352.2	12.012	8.908	4.204	2.628	1.911
352.3	12.016	8.910	4.205	2.628	1.911
352.4	12.019	8.913	4.206	2.629	1.912
352.5	12.022	8.915	4.208	2.630	1.913
352.6	12.026	8.918	4.209	2.631	1.913
352.7	12.029	8.920	4.210	2.631	1.914
352.8	12.033	8.923	4.211	2.632	1.914
352.9	12.036	8.925	4.212	2.633	1.915
353.0	12.039	8.928	4.214	2.634	1.915
353.1	12.043	8.930	4.215	2.634	1.916
353.2	12.046	8.933	4.216	2.635	1.916
353.3	12.050	8.935	4.217	2.636	1.917
353.4	12.053	8.938	4.218	2.637	1.917
353.5	12.056	8.940	4.220	2.637	1.918
353.6	12.060	8.943	4.221	2.638	1.919
353.7	12.063	8.946	4.222	2.639	1.919
353.8	12.067	8.948	4.223	2.640	1.920
353.9	12.070	8.951	4.224	2.640	1.920
354.0	12.074	8.953	4.226	2.641	1.921
354.1	12.077	8.956	4.227	2.642	1.921
354.2	12.080	8.958	4.228	2.642	1.922
354.3	12.084	8.961	4.229	2.643	1.922
354.4	12.087	8.963	4.230	2.644	1.923
354.5	12.091	8.966	4.232	2.645	1.923
354.6	12.094	8.968	4.233	2.645	1.924
354.7	12.097	8.971	4.234	2.646	1.925
354.8	12.101	8.973	4.235	2.647	1.925
354.9	12.104	8.976	4.236	2.648	1.926

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
355.0	12.108	8.978	4.238	2.648	1.926
355.1	12.111	8.981	4.239	2.649	1.927
355.2	12.114	8.983	4.240	2.650	1.927
355.3	12.118	8.986	4.241	2.651	1.928
355.4	12.121	8.989	4.242	2.651	1.928
355.5	12.125	8.991	4.243	2.652	1.929
355.6	12.128	8.994	4.245	2.653	1.929
355.7	12.132	8.996	4.246	2.654	1.930
355.8	12.135	8.999	4.247	2.654	1.930
355.9	12.138	9.001	4.248	2.655	1.931
356.0	12.142	9.004	4.249	2.656	1.932
356.1	12.145	9.006	4.251	2.657	1.932
356.2	12.149	9.009	4.252	2.657	1.933
356.3	12.152	9.011	4.253	2.658	1.933
356.4	12.155	9.014	4.254	2.659	1.934
356.5	12.159	9.016	4.255	2.660	1.934
356.6	12.162	9.019	4.257	2.660	1.935
356.7	12.166	9.021	4.258	2.661	1.935
356.8	12.169	9.024	4.259	2.662	1.936
356.9	12.172	9.026	4.260	2.663	1.936
357.0	12.176	9.029	4.261	2.663	1.937
357.1	12.179	9.032	4.263	2.664	1.938
357.2	12.183	9.034	4.264	2.665	1.938
357.3	12.186	9.037	4.265	2.666	1.939
357.4	12.189	9.039	4.266	2.666	1.939
357.5	12.193	9.042	4.267	2.667	1.940
357.6	12.196	9.044	4.269	2.668	1.940
357.7	12.200	9.047	4.270	2.669	1.941
357.8	12.203	9.049	4.271	2.669	1.941
357.9	12.207	9.052	4.272	2.670	1.942
358.0	12.210	9.054	4.273	2.671	1.942
358.1	12.213	9.057	4.275	2.672	1.943
358.2	12.217	9.059	4.276	2.672	1.944
358.3	12.220	9.062	4.277	2.673	1.944
358.4	12.224	9.064	4.278	2.674	1.945
358.5	12.227	9.067	4.279	2.675	1.945
358.6	12.230	9.069	4.280	2.675	1.946
358.7	12.234	9.072	4.282	2.676	1.946
358.8	12.237	9.075	4.283	2.677	1.947
358.9	12.241	9.077	4.284	2.678	1.947
359.0	12.244	9.080	4.285	2.678	1.948
359.1	12.247	9.082	4.286	2.679	1.948
359.2	12.251	9.085	4.288	2.680	1.949
359.3	12.254	9.087	4.289	2.681	1.949
359.4	12.258	9.090	4.290	2.681	1.950
359.5	12.261	9.092	4.291	2.682	1.951
359.6	12.265	9.095	4.292	2.683	1.951
359.7	12.268	9.097	4.294	2.684	1.952
359.8	12.271	9.100	4.295	2.684	1.952
359.9	12.275	9.102	4.296	2.685	1.953

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
360.0	12.278	9.105	4.297	2.686	1.953
360.1	12.282	9.107	4.298	2.687	1.954
360.2	12.285	9.110	4.300	2.687	1.954
360.3	12.288	9.112	4.301	2.688	1.955
360.4	12.292	9.115	4.302	2.689	1.955
360.5	12.295	9.118	4.303	2.689	1.956
360.6	12.299	9.120	4.304	2.690	1.957
360.7	12.302	9.123	4.306	2.691	1.957
360.8	12.305	9.125	4.307	2.692	1.958
360.9	12.309	9.128	4.308	2.692	1.958
361.0	12.312	9.130	4.309	2.693	1.959
361.1	12.316	9.133	4.310	2.694	1.959
361.2	12.319	9.135	4.312	2.695	1.960
361.3	12.323	9.138	4.313	2.695	1.960
361.4	12.326	9.140	4.314	2.696	1.961
361.5	12.329	9.143	4.315	2.697	1.961
361.6	12.333	9.145	4.316	2.698	1.962
361.7	12.336	9.148	4.317	2.698	1.962
361.8	12.340	9.150	4.319	2.699	1.963
361.9	12.343	9.153	4.320	2.700	1.964
362.0	12.346	9.155	4.321	2.701	1.964
362.1	12.350	9.158	4.322	2.701	1.965
362.2	12.353	9.161	4.323	2.702	1.965
362.3	12.357	9.163	4.325	2.703	1.966
362.4	12.360	9.166	4.326	2.704	1.966
362.5	12.363	9.168	4.327	2.704	1.967
362.6	12.367	9.171	4.328	2.705	1.967
362.7	12.370	9.173	4.329	2.706	1.968
362.8	12.374	9.176	4.331	2.707	1.968
362.9	12.377	9.178	4.332	2.707	1.969
363.0	12.380	9.181	4.333	2.708	1.970
363.1	12.384	9.183	4.334	2.709	1.970
363.2	12.387	9.186	4.335	2.710	1.971
363.3	12.391	9.188	4.337	2.710	1.971
363.4	12.394	9.191	4.338	2.711	1.972
363.5	12.398	9.193	4.339	2.712	1.972
363.6	12.401	9.196	4.340	2.713	1.973
363.7	12.404	9.198	4.341	2.713	1.973
363.8	12.408	9.201	4.343	2.714	1.974
363.9	12.411	9.204	4.344	2.715	1.974
364.0	12.415	9.206	4.345	2.716	1.975
364.1	12.418	9.209	4.346	2.716	1.976
364.2	12.421	9.211	4.347	2.717	1.976
364.3	12.425	9.214	4.349	2.718	1.977
364.4	12.428	9.216	4.350	2.719	1.977
364.5	12.432	9.219	4.351	2.719	1.978
364.6	12.435	9.221	4.352	2.720	1.978
364.7	12.438	9.224	4.353	2.721	1.979
364.8	12.442	9.226	4.355	2.722	1.979
364.9	12.445	9.229	4.356	2.722	1.980

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
365.0	12.449	9.231	4.357	2.723	1.980
365.1	12.452	9.234	4.358	2.724	1.981
365.2	12.456	9.236	4.359	2.725	1.981
365.3	12.459	9.239	4.360	2.725	1.982
365.4	12.462	9.241	4.362	2.726	1.983
365.5	12.466	9.244	4.363	2.727	1.983
365.6	12.469	9.247	4.364	2.728	1.984
365.7	12.473	9.249	4.365	2.728	1.984
365.8	12.476	9.252	4.366	2.729	1.985
365.9	12.479	9.254	4.368	2.730	1.985
366.0	12.483	9.257	4.369	2.731	1.986
366.1	12.486	9.259	4.370	2.731	1.986
366.2	12.490	9.262	4.371	2.732	1.987
366.3	12.493	9.264	4.372	2.733	1.987
366.4	12.496	9.267	4.374	2.734	1.988
366.5	12.500	9.269	4.375	2.734	1.989
366.6	12.503	9.272	4.376	2.735	1.989
366.7	12.507	9.274	4.377	2.736	1.990
366.8	12.510	9.277	4.378	2.736	1.990
366.9	12.514	9.279	4.380	2.737	1.991
367.0	12.517	9.282	4.381	2.738	1.991
367.1	12.520	9.284	4.382	2.739	1.992
367.2	12.524	9.287	4.383	2.739	1.992
367.3	12.527	9.290	4.384	2.740	1.993
367.4	12.531	9.292	4.386	2.741	1.993
367.5	12.534	9.295	4.387	2.742	1.994
367.6	12.537	9.297	4.388	2.742	1.995
367.7	12.541	9.300	4.389	2.743	1.995
367.8	12.544	9.302	4.390	2.744	1.996
367.9	12.548	9.305	4.392	2.745	1.996
368.0	12.551	9.307	4.393	2.745	1.997
368.1	12.554	9.310	4.394	2.746	1.997
368.2	12.558	9.312	4.395	2.747	1.998
368.3	12.561	9.315	4.396	2.748	1.998
368.4	12.565	9.317	4.397	2.748	1.999
368.5	12.568	9.320	4.399	2.749	1.999
368.6	12.571	9.322	4.400	2.750	2.000
368.7	12.575	9.325	4.401	2.751	2.000
368.8	12.578	9.327	4.402	2.751	2.001
368.9	12.582	9.330	4.403	2.752	2.002
369.0	12.585	9.333	4.405	2.753	2.002
369.1	12.589	9.335	4.406	2.754	2.003
369.2	12.592	9.338	4.407	2.754	2.003
369.3	12.595	9.340	4.408	2.755	2.004
369.4	12.599	9.343	4.409	2.756	2.004
369.5	12.602	9.345	4.411	2.757	2.005
369.6	12.606	9.348	4.412	2.757	2.005
369.7	12.609	9.350	4.413	2.758	2.006
369.8	12.612	9.353	4.414	2.759	2.006
369.9	12.616	9.355	4.415	2.760	2.007

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
370.0	12.619	9.358	4.417	2.760	2.008
370.1	12.623	9.360	4.418	2.761	2.008
370.2	12.626	9.363	4.419	2.762	2.009
370.3	12.629	9.365	4.420	2.763	2.009
370.4	12.633	9.368	4.421	2.763	2.010
370.5	12.636	9.370	4.423	2.764	2.010
370.6	12.640	9.373	4.424	2.765	2.011
370.7	12.643	9.376	4.425	2.766	2.011
370.8	12.647	9.378	4.426	2.766	2.012
370.9	12.650	9.381	4.427	2.767	2.012
371.0	12.653	9.383	4.429	2.768	2.013
371.1	12.657	9.386	4.430	2.769	2.013
371.2	12.660	9.388	4.431	2.769	2.014
371.3	12.664	9.391	4.432	2.770	2.015
371.4	12.667	9.393	4.433	2.771	2.015
371.5	12.670	9.396	4.434	2.772	2.016
371.6	12.674	9.398	4.436	2.772	2.016
371.7	12.677	9.401	4.437	2.773	2.017
371.8	12.681	9.403	4.438	2.774	2.017
371.9	12.684	9.406	4.439	2.775	2.018
372.0	12.687	9.408	4.440	2.775	2.018
372.1	12.691	9.411	4.442	2.776	2.019
372.2	12.694	9.413	4.443	2.777	2.019
372.3	12.698	9.416	4.444	2.778	2.020
372.4	12.701	9.418	4.445	2.778	2.021
372.5	12.705	9.421	4.446	2.779	2.021
372.6	12.708	9.424	4.448	2.780	2.022
372.7	12.711	9.426	4.449	2.781	2.022
372.8	12.715	9.429	4.450	2.781	2.023
372.9	12.718	9.431	4.451	2.782	2.023
373.0	12.722	9.434	4.452	2.783	2.024
373.1	12.725	9.436	4.454	2.783	2.024
373.2	12.728	9.439	4.455	2.784	2.025
373.3	12.732	9.441	4.456	2.785	2.025
373.4	12.735	9.444	4.457	2.786	2.026
373.5	12.739	9.446	4.458	2.786	2.027
373.6	12.742	9.449	4.460	2.787	2.027
373.7	12.745	9.451	4.461	2.788	2.028
373.8	12.749	9.454	4.462	2.789	2.028
373.9	12.752	9.456	4.463	2.789	2.029
374.0	12.756	9.459	4.464	2.790	2.029
374.1	12.759	9.461	4.466	2.791	2.030
374.2	12.762	9.464	4.467	2.792	2.030
374.3	12.766	9.467	4.468	2.792	2.031
374.4	12.769	9.469	4.469	2.793	2.031
374.5	12.773	9.472	4.470	2.794	2.032
374.6	12.776	9.474	4.471	2.795	2.032
374.7	12.780	9.477	4.473	2.795	2.033
374.8	12.783	9.479	4.474	2.796	2.034
374.9	12.786	9.482	4.475	2.797	2.034

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
375.0	12.790	9.484	4.476	2.798	2.035
375.1	12.793	9.487	4.477	2.798	2.035
375.2	12.797	9.489	4.479	2.799	2.036
375.3	12.800	9.492	4.480	2.800	2.036
375.4	12.803	9.494	4.481	2.801	2.037
375.5	12.807	9.497	4.482	2.801	2.037
375.6	12.810	9.499	4.483	2.802	2.038
375.7	12.814	9.502	4.485	2.803	2.038
375.8	12.817	9.504	4.486	2.804	2.039
375.9	12.820	9.507	4.487	2.804	2.040
376.0	12.824	9.510	4.488	2.805	2.040
376.1	12.827	9.512	4.489	2.806	2.041
376.2	12.831	9.515	4.491	2.807	2.041
376.3	12.834	9.517	4.492	2.807	2.042
376.4	12.838	9.520	4.493	2.808	2.042
376.5	12.841	9.522	4.494	2.809	2.043
376.6	12.844	9.525	4.495	2.810	2.043
376.7	12.848	9.527	4.497	2.810	2.044
376.8	12.851	9.530	4.498	2.811	2.044
376.9	12.855	9.532	4.499	2.812	2.045
377.0	12.858	9.535	4.500	2.813	2.046
377.1	12.861	9.537	4.501	2.813	2.046
377.2	12.865	9.540	4.503	2.814	2.047
377.3	12.868	9.542	4.504	2.815	2.047
377.4	12.872	9.545	4.505	2.816	2.048
377.5	12.875	9.547	4.506	2.816	2.048
377.6	12.878	9.550	4.507	2.817	2.049
377.7	12.882	9.553	4.508	2.818	2.049
377.8	12.885	9.555	4.510	2.819	2.050
377.9	12.889	9.558	4.511	2.819	2.050
378.0	12.892	9.560	4.512	2.820	2.051
378.1	12.895	9.563	4.513	2.821	2.051
378.2	12.899	9.565	4.514	2.822	2.052
378.3	12.902	9.568	4.516	2.822	2.053
378.4	12.906	9.570	4.517	2.823	2.053
378.5	12.909	9.573	4.518	2.824	2.054
378.6	12.913	9.575	4.519	2.825	2.054
378.7	12.916	9.578	4.520	2.825	2.055
378.8	12.919	9.580	4.522	2.826	2.055
378.9	12.923	9.583	4.523	2.827	2.056
379.0	12.926	9.585	4.524	2.828	2.056
379.1	12.930	9.588	4.525	2.828	2.057
379.2	12.933	9.590	4.526	2.829	2.057
379.3	12.936	9.593	4.528	2.830	2.058
379.4	12.940	9.596	4.529	2.830	2.059
379.5	12.943	9.598	4.530	2.831	2.059
379.6	12.947	9.601	4.531	2.832	2.060
379.7	12.950	9.603	4.532	2.833	2.060
379.8	12.953	9.606	4.534	2.833	2.061
379.9	12.957	9.608	4.535	2.834	2.061

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
380.0	12.960	9.611	4.536	2.835	2.062
380.1	12.964	9.613	4.537	2.836	2.062
380.2	12.967	9.616	4.538	2.836	2.063
380.3	12.971	9.618	4.540	2.837	2.063
380.4	12.974	9.621	4.541	2.838	2.064
380.5	12.977	9.623	4.542	2.839	2.065
380.6	12.981	9.626	4.543	2.839	2.065
380.7	12.984	9.628	4.544	2.840	2.066
380.8	12.988	9.631	4.545	2.841	2.066
380.9	12.991	9.633	4.547	2.842	2.067
381.0	12.994	9.636	4.548	2.842	2.067
381.1	12.998	9.639	4.549	2.843	2.068
381.2	13.001	9.641	4.550	2.844	2.068
381.3	13.005	9.644	4.551	2.845	2.069
381.4	13.008	9.646	4.553	2.845	2.069
381.5	13.011	9.649	4.554	2.846	2.070
381.6	13.015	9.651	4.555	2.847	2.070
381.7	13.018	9.654	4.556	2.848	2.071
381.8	13.022	9.656	4.557	2.848	2.072
381.9	13.025	9.659	4.559	2.849	2.072
382.0	13.029	9.661	4.560	2.850	2.073
382.1	13.032	9.664	4.561	2.851	2.073
382.2	13.035	9.666	4.562	2.851	2.074
382.3	13.039	9.669	4.563	2.852	2.074
382.4	13.042	9.671	4.565	2.853	2.075
382.5	13.046	9.674	4.566	2.854	2.075
382.6	13.049	9.676	4.567	2.854	2.076
382.7	13.052	9.679	4.568	2.855	2.076
382.8	13.056	9.682	4.569	2.856	2.077
382.9	13.059	9.684	4.571	2.857	2.078
383.0	13.063	9.687	4.572	2.857	2.078
383.1	13.066	9.689	4.573	2.858	2.079
383.2	13.069	9.692	4.574	2.859	2.079
383.3	13.073	9.694	4.575	2.860	2.080
383.4	13.076	9.697	4.577	2.860	2.080
383.5	13.080	9.699	4.578	2.861	2.081
383.6	13.083	9.702	4.579	2.862	2.081
383.7	13.086	9.704	4.580	2.863	2.082
383.8	13.090	9.707	4.581	2.863	2.082
383.9	13.093	9.709	4.582	2.864	2.083
384.0	13.097	9.712	4.584	2.865	2.083
384.1	13.100	9.714	4.585	2.866	2.084
384.2	13.104	9.717	4.586	2.866	2.085
384.3	13.107	9.719	4.587	2.867	2.085
384.4	13.110	9.722	4.588	2.868	2.086
384.5	13.114	9.725	4.590	2.869	2.086
384.6	13.117	9.727	4.591	2.869	2.087
384.7	13.121	9.730	4.592	2.870	2.087
384.8	13.124	9.732	4.593	2.871	2.088
384.9	13.127	9.735	4.594	2.872	2.088

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
385.0	13.131	9.737	4.596	2.872	2.089
385.1	13.134	9.740	4.597	2.873	2.089
385.2	13.138	9.742	4.598	2.874	2.090
385.3	13.141	9.745	4.599	2.875	2.091
385.4	13.144	9.747	4.600	2.875	2.091
385.5	13.148	9.750	4.602	2.876	2.092
385.6	13.151	9.752	4.603	2.877	2.092
385.7	13.155	9.755	4.604	2.877	2.093
385.8	13.158	9.757	4.605	2.878	2.093
385.9	13.162	9.760	4.606	2.879	2.094
386.0	13.165	9.762	4.608	2.880	2.094
386.1	13.168	9.765	4.609	2.880	2.095
386.2	13.172	9.768	4.610	2.881	2.095
386.3	13.175	9.770	4.611	2.882	2.096
386.4	13.179	9.773	4.612	2.883	2.097
386.5	13.182	9.775	4.614	2.883	2.097
386.6	13.185	9.778	4.615	2.884	2.098
386.7	13.189	9.780	4.616	2.885	2.098
386.8	13.192	9.783	4.617	2.886	2.099
386.9	13.196	9.785	4.618	2.886	2.099
387.0	13.199	9.788	4.619	2.887	2.100
387.1	13.202	9.790	4.621	2.888	2.100
387.2	13.206	9.793	4.622	2.889	2.101
387.3	13.209	9.795	4.623	2.889	2.101
387.4	13.213	9.798	4.624	2.890	2.102
387.5	13.216	9.800	4.625	2.891	2.102
387.6	13.220	9.803	4.627	2.892	2.103
387.7	13.223	9.805	4.628	2.892	2.104
387.8	13.226	9.808	4.629	2.893	2.104
387.9	13.230	9.811	4.630	2.894	2.105
388.0	13.233	9.813	4.631	2.895	2.105
388.1	13.237	9.816	4.633	2.895	2.106
388.2	13.240	9.818	4.634	2.896	2.106
388.3	13.243	9.821	4.635	2.897	2.107
388.4	13.247	9.823	4.636	2.898	2.107
388.5	13.250	9.826	4.637	2.898	2.108
388.6	13.254	9.828	4.639	2.899	2.108
388.7	13.257	9.831	4.640	2.900	2.109
388.8	13.260	9.833	4.641	2.901	2.110
388.9	13.264	9.836	4.642	2.901	2.110
389.0	13.267	9.838	4.643	2.902	2.111
389.1	13.271	9.841	4.645	2.903	2.111
389.2	13.274	9.843	4.646	2.904	2.112
389.3	13.277	9.846	4.647	2.904	2.112
389.4	13.281	9.848	4.648	2.905	2.113
389.5	13.284	9.851	4.649	2.906	2.113
389.6	13.288	9.854	4.651	2.907	2.114
389.7	13.291	9.856	4.652	2.907	2.114
389.8	13.295	9.859	4.653	2.908	2.115
389.9	13.298	9.861	4.654	2.909	2.116

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
390.0	13.301	9.864	4.655	2.910	2.116
390.1	13.305	9.866	4.657	2.910	2.117
390.2	13.308	9.869	4.658	2.911	2.117
390.3	13.312	9.871	4.659	2.912	2.118
390.4	13.315	9.874	4.660	2.913	2.118
390.5	13.318	9.876	4.661	2.913	2.119
390.6	13.322	9.879	4.662	2.914	2.119
390.7	13.325	9.881	4.664	2.915	2.120
390.8	13.329	9.884	4.665	2.916	2.120
390.9	13.332	9.886	4.666	2.916	2.121
391.0	13.335	9.889	4.667	2.917	2.121
391.1	13.339	9.891	4.668	2.918	2.122
391.2	13.342	9.894	4.670	2.919	2.123
391.3	13.346	9.897	4.671	2.919	2.123
391.4	13.349	9.899	4.672	2.920	2.124
391.5	13.353	9.902	4.673	2.921	2.124
391.6	13.356	9.904	4.674	2.922	2.125
391.7	13.359	9.907	4.676	2.922	2.125
391.8	13.363	9.909	4.677	2.923	2.126
391.9	13.366	9.912	4.678	2.924	2.126
392.0	13.370	9.914	4.679	2.924	2.127
392.1	13.373	9.917	4.680	2.925	2.127
392.2	13.376	9.919	4.682	2.926	2.128
392.3	13.380	9.922	4.683	2.927	2.129
392.4	13.383	9.924	4.684	2.927	2.129
392.5	13.387	9.927	4.685	2.928	2.130
392.6	13.390	9.929	4.686	2.929	2.130
392.7	13.393	9.932	4.688	2.930	2.131
392.8	13.397	9.934	4.689	2.930	2.131
392.9	13.400	9.937	4.690	2.931	2.132
393.0	13.404	9.940	4.691	2.932	2.132
393.1	13.407	9.942	4.692	2.933	2.133
393.2	13.410	9.945	4.694	2.933	2.133
393.3	13.414	9.947	4.695	2.934	2.134
393.4	13.417	9.950	4.696	2.935	2.134
393.5	13.421	9.952	4.697	2.936	2.135
393.6	13.424	9.955	4.698	2.936	2.136
393.7	13.428	9.957	4.699	2.937	2.136
393.8	13.431	9.960	4.701	2.938	2.137
393.9	13.434	9.962	4.702	2.939	2.137
394.0	13.438	9.965	4.703	2.939	2.138
394.1	13.441	9.967	4.704	2.940	2.138
394.2	13.445	9.970	4.705	2.941	2.139
394.3	13.448	9.972	4.707	2.942	2.139
394.4	13.451	9.975	4.708	2.942	2.140
394.5	13.455	9.977	4.709	2.943	2.140
394.6	13.458	9.980	4.710	2.944	2.141
394.7	13.462	9.982	4.711	2.945	2.142
394.8	13.465	9.985	4.713	2.945	2.142
394.9	13.468	9.988	4.714	2.946	2.143

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
395.0	13.472	9.990	4.715	2.947	2.143
395.1	13.475	9.993	4.716	2.948	2.144
395.2	13.479	9.995	4.717	2.948	2.144
395.3	13.482	9.998	4.719	2.949	2.145
395.4	13.486	10.000	4.720	2.950	2.145
395.5	13.489	10.003	4.721	2.951	2.146
395.6	13.492	10.005	4.722	2.951	2.146
395.7	13.496	10.008	4.723	2.952	2.147
395.8	13.499	10.010	4.725	2.953	2.148
395.9	13.503	10.013	4.726	2.954	2.148
396.0	13.506	10.015	4.727	2.954	2.149
396.1	13.509	10.018	4.728	2.955	2.149
396.2	13.513	10.020	4.729	2.956	2.150
396.3	13.516	10.023	4.731	2.957	2.150
396.4	13.520	10.025	4.732	2.957	2.151
396.5	13.523	10.028	4.733	2.958	2.151
396.6	13.526	10.031	4.734	2.959	2.152
396.7	13.530	10.033	4.735	2.960	2.152
396.8	13.533	10.036	4.736	2.960	2.153
396.9	13.537	10.038	4.738	2.961	2.153
397.0	13.540	10.041	4.739	2.962	2.154
397.1	13.544	10.043	4.740	2.963	2.155
397.2	13.547	10.046	4.741	2.963	2.155
397.3	13.550	10.048	4.742	2.964	2.156
397.4	13.554	10.051	4.744	2.965	2.156
397.5	13.557	10.053	4.745	2.966	2.157
397.6	13.561	10.056	4.746	2.966	2.157
397.7	13.564	10.058	4.747	2.967	2.158
397.8	13.567	10.061	4.748	2.968	2.158
397.9	13.571	10.063	4.750	2.969	2.159
398.0	13.574	10.066	4.751	2.969	2.159
398.1	13.578	10.068	4.752	2.970	2.160
398.2	13.581	10.071	4.753	2.971	2.161
398.3	13.584	10.074	4.754	2.971	2.161
398.4	13.588	10.076	4.756	2.972	2.162
398.5	13.591	10.079	4.757	2.973	2.162
398.6	13.595	10.081	4.758	2.974	2.163
398.7	13.598	10.084	4.759	2.974	2.163
398.8	13.601	10.086	4.760	2.975	2.164
398.9	13.605	10.089	4.762	2.976	2.164
399.0	13.608	10.091	4.763	2.977	2.165
399.1	13.612	10.094	4.764	2.977	2.165
399.2	13.615	10.096	4.765	2.978	2.166
399.3	13.619	10.099	4.766	2.979	2.167
399.4	13.622	10.101	4.768	2.980	2.167
399.5	13.625	10.104	4.769	2.980	2.168
399.6	13.629	10.106	4.770	2.981	2.168
399.7	13.632	10.109	4.771	2.982	2.169
399.8	13.636	10.111	4.772	2.983	2.169
399.9	13.639	10.114	4.773	2.983	2.170

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
400.0	13.642	10.117	4.775	2.984	2.170
400.1	13.646	10.119	4.776	2.985	2.171
400.2	13.649	10.122	4.777	2.986	2.171
400.3	13.653	10.124	4.778	2.986	2.172
400.4	13.656	10.127	4.779	2.987	2.172
400.5	13.659	10.129	4.781	2.988	2.173
400.6	13.663	10.132	4.782	2.989	2.174
400.7	13.666	10.134	4.783	2.989	2.174
400.8	13.670	10.137	4.784	2.990	2.175
400.9	13.673	10.139	4.785	2.991	2.175
401.0	13.677	10.142	4.787	2.992	2.176
401.1	13.680	10.144	4.788	2.992	2.176
401.2	13.683	10.147	4.789	2.993	2.177
401.3	13.687	10.149	4.790	2.994	2.177
401.4	13.690	10.152	4.791	2.995	2.178
401.5	13.694	10.154	4.793	2.995	2.178
401.6	13.697	10.157	4.794	2.996	2.179
401.7	13.700	10.160	4.795	2.997	2.180
401.8	13.704	10.162	4.796	2.998	2.180
401.9	13.707	10.165	4.797	2.998	2.181
402.0	13.711	10.167	4.799	2.999	2.181
402.1	13.714	10.170	4.800	3.000	2.182
402.2	13.717	10.172	4.801	3.001	2.182
402.3	13.721	10.175	4.802	3.001	2.183
402.4	13.724	10.177	4.803	3.002	2.183
402.5	13.728	10.180	4.805	3.003	2.184
402.6	13.731	10.182	4.806	3.004	2.184
402.7	13.735	10.185	4.807	3.004	2.185
402.8	13.738	10.187	4.808	3.005	2.185
402.9	13.741	10.190	4.809	3.006	2.186
403.0	13.745	10.192	4.810	3.007	2.187
403.1	13.748	10.195	4.812	3.007	2.187
403.2	13.752	10.197	4.813	3.008	2.188
403.3	13.755	10.200	4.814	3.009	2.188
403.4	13.758	10.203	4.815	3.010	2.189
403.5	13.762	10.205	4.816	3.010	2.189
403.6	13.765	10.208	4.818	3.011	2.190
403.7	13.769	10.210	4.819	3.012	2.190
403.8	13.772	10.213	4.820	3.013	2.191
403.9	13.775	10.215	4.821	3.013	2.191
404.0	13.779	10.218	4.822	3.014	2.192
404.1	13.782	10.220	4.824	3.015	2.193
404.2	13.786	10.223	4.825	3.016	2.193
404.3	13.789	10.225	4.826	3.016	2.194
404.4	13.792	10.228	4.827	3.017	2.194
404.5	13.796	10.230	4.828	3.018	2.195
404.6	13.799	10.233	4.830	3.018	2.195
404.7	13.803	10.235	4.831	3.019	2.196
404.8	13.806	10.238	4.832	3.020	2.196
404.9	13.810	10.240	4.833	3.021	2.197

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
405.0	13.813	10.243	4.834	3.021	2.197
405.1	13.816	10.246	4.836	3.022	2.198
405.2	13.820	10.248	4.837	3.023	2.199
405.3	13.823	10.251	4.838	3.024	2.199
405.4	13.827	10.253	4.839	3.024	2.200
405.5	13.830	10.256	4.840	3.025	2.200
405.6	13.833	10.258	4.842	3.026	2.201
405.7	13.837	10.261	4.843	3.027	2.201
405.8	13.840	10.263	4.844	3.027	2.202
405.9	13.844	10.266	4.845	3.028	2.202
406.0	13.847	10.268	4.846	3.029	2.203
406.1	13.850	10.271	4.847	3.030	2.203
406.2	13.854	10.273	4.849	3.030	2.204
406.3	13.857	10.276	4.850	3.031	2.204
406.4	13.861	10.278	4.851	3.032	2.205
406.5	13.864	10.281	4.852	3.033	2.206
406.6	13.868	10.283	4.853	3.033	2.206
406.7	13.871	10.286	4.855	3.034	2.207
406.8	13.874	10.289	4.856	3.035	2.207
406.9	13.878	10.291	4.857	3.036	2.208
407.0	13.881	10.294	4.858	3.036	2.208
407.1	13.885	10.296	4.859	3.037	2.209
407.2	13.888	10.299	4.861	3.038	2.209
407.3	13.891	10.301	4.862	3.039	2.210
407.4	13.895	10.304	4.863	3.039	2.210
407.5	13.898	10.306	4.864	3.040	2.211
407.6	13.902	10.309	4.865	3.041	2.212
407.7	13.905	10.311	4.867	3.042	2.212
407.8	13.908	10.314	4.868	3.042	2.213
407.9	13.912	10.316	4.869	3.043	2.213
408.0	13.915	10.319	4.870	3.044	2.214
408.1	13.919	10.321	4.871	3.045	2.214
408.2	13.922	10.324	4.873	3.045	2.215
408.3	13.925	10.326	4.874	3.046	2.215
408.4	13.929	10.329	4.875	3.047	2.216
408.5	13.932	10.332	4.876	3.048	2.216
408.6	13.936	10.334	4.877	3.048	2.217
408.7	13.939	10.337	4.879	3.049	2.218
408.8	13.943	10.339	4.880	3.050	2.218
408.9	13.946	10.342	4.881	3.051	2.219
409.0	13.949	10.344	4.882	3.051	2.219
409.1	13.953	10.347	4.883	3.052	2.220
409.2	13.956	10.349	4.884	3.053	2.220
409.3	13.960	10.352	4.886	3.054	2.221
409.4	13.963	10.354	4.887	3.054	2.221
409.5	13.966	10.357	4.888	3.055	2.222
409.6	13.970	10.359	4.889	3.056	2.222
409.7	13.973	10.362	4.890	3.057	2.223
409.8	13.977	10.364	4.892	3.057	2.223
409.9	13.980	10.367	4.893	3.058	2.224

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
410.0	13.983	10.369	4.894	3.059	2.225
410.1	13.987	10.372	4.895	3.060	2.225
410.2	13.990	10.375	4.896	3.060	2.226
410.3	13.994	10.377	4.898	3.061	2.226
410.4	13.997	10.380	4.899	3.062	2.227
410.5	14.001	10.382	4.900	3.063	2.227
410.6	14.004	10.385	4.901	3.063	2.228
410.7	14.007	10.387	4.902	3.064	2.228
410.8	14.011	10.390	4.904	3.065	2.229
410.9	14.014	10.392	4.905	3.065	2.229
411.0	14.018	10.395	4.906	3.066	2.230
411.1	14.021	10.397	4.907	3.067	2.231
411.2	14.024	10.400	4.908	3.068	2.231
411.3	14.028	10.402	4.910	3.068	2.232
411.4	14.031	10.405	4.911	3.069	2.232
411.5	14.035	10.407	4.912	3.070	2.233
411.6	14.038	10.410	4.913	3.071	2.233
411.7	14.041	10.412	4.914	3.071	2.234
411.8	14.045	10.415	4.916	3.072	2.234
411.9	14.048	10.418	4.917	3.073	2.235
412.0	14.052	10.420	4.918	3.074	2.235
412.1	14.055	10.423	4.919	3.074	2.236
412.2	14.059	10.425	4.920	3.075	2.236
412.3	14.062	10.428	4.921	3.076	2.237
412.4	14.065	10.430	4.923	3.077	2.238
412.5	14.069	10.433	4.924	3.077	2.238
412.6	14.072	10.435	4.925	3.078	2.239
412.7	14.076	10.438	4.926	3.079	2.239
412.8	14.079	10.440	4.927	3.080	2.240
412.9	14.082	10.443	4.929	3.080	2.240
413.0	14.086	10.445	4.930	3.081	2.241
413.1	14.089	10.448	4.931	3.082	2.241
413.2	14.093	10.450	4.932	3.083	2.242
413.3	14.096	10.453	4.933	3.083	2.242
413.4	14.099	10.455	4.935	3.084	2.243
413.5	14.103	10.458	4.936	3.085	2.244
413.6	14.106	10.461	4.937	3.086	2.244
413.7	14.110	10.463	4.938	3.086	2.245
413.8	14.113	10.466	4.939	3.087	2.245
413.9	14.116	10.468	4.941	3.088	2.246
414.0	14.120	10.471	4.942	3.089	2.246
414.1	14.123	10.473	4.943	3.089	2.247
414.2	14.127	10.476	4.944	3.090	2.247
414.3	14.130	10.478	4.945	3.091	2.248
414.4	14.134	10.481	4.947	3.092	2.248
414.5	14.137	10.483	4.948	3.092	2.249
414.6	14.140	10.486	4.949	3.093	2.250
414.7	14.144	10.488	4.950	3.094	2.250
414.8	14.147	10.491	4.951	3.095	2.251
414.9	14.151	10.493	4.953	3.095	2.251

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
415.0	14.154	10.496	4.954	3.096	2.252
415.1	14.157	10.498	4.955	3.097	2.252
415.2	14.161	10.501	4.956	3.098	2.253
415.3	14.164	10.503	4.957	3.098	2.253
415.4	14.168	10.506	4.958	3.099	2.254
415.5	14.171	10.509	4.960	3.100	2.254
415.6	14.174	10.511	4.961	3.101	2.255
415.7	14.178	10.514	4.962	3.101	2.255
415.8	14.181	10.516	4.963	3.102	2.256
415.9	14.185	10.519	4.964	3.103	2.257
416.0	14.188	10.521	4.966	3.104	2.257
416.1	14.192	10.524	4.967	3.104	2.258
416.2	14.195	10.526	4.968	3.105	2.258
416.3	14.198	10.529	4.969	3.106	2.259
416.4	14.202	10.531	4.970	3.107	2.259
416.5	14.205	10.534	4.972	3.107	2.260
416.6	14.209	10.536	4.973	3.108	2.260
416.7	14.212	10.539	4.974	3.109	2.261
416.8	14.215	10.541	4.975	3.110	2.261
416.9	14.219	10.544	4.976	3.110	2.262
417.0	14.222	10.546	4.978	3.111	2.263
417.1	14.226	10.549	4.979	3.112	2.263
417.2	14.229	10.552	4.980	3.112	2.264
417.3	14.232	10.554	4.981	3.113	2.264
417.4	14.236	10.557	4.982	3.114	2.265
417.5	14.239	10.559	4.984	3.115	2.265
417.6	14.243	10.562	4.985	3.115	2.266
417.7	14.246	10.564	4.986	3.116	2.266
417.8	14.250	10.567	4.987	3.117	2.267
417.9	14.253	10.569	4.988	3.118	2.267
418.0	14.256	10.572	4.990	3.118	2.268
418.1	14.260	10.574	4.991	3.119	2.269
418.2	14.263	10.577	4.992	3.120	2.269
418.3	14.267	10.579	4.993	3.121	2.270
418.4	14.270	10.582	4.994	3.121	2.270
418.5	14.273	10.584	4.996	3.122	2.271
418.6	14.277	10.587	4.997	3.123	2.271
418.7	14.280	10.589	4.998	3.124	2.272
418.8	14.284	10.592	4.999	3.124	2.272
418.9	14.287	10.595	5.000	3.125	2.273
419.0	14.290	10.597	5.001	3.126	2.273
419.1	14.294	10.600	5.003	3.127	2.274
419.2	14.297	10.602	5.004	3.127	2.274
419.3	14.301	10.605	5.005	3.128	2.275
419.4	14.304	10.607	5.006	3.129	2.276
419.5	14.307	10.610	5.007	3.130	2.276
419.6	14.311	10.612	5.009	3.130	2.277
419.7	14.314	10.615	5.010	3.131	2.277
419.8	14.318	10.617	5.011	3.132	2.278
419.9	14.321	10.620	5.012	3.133	2.278

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
420.0	14.325	10.622	5.013	3.133	2.279
420.1	14.328	10.625	5.015	3.134	2.279
420.2	14.331	10.627	5.016	3.135	2.280
420.3	14.335	10.630	5.017	3.136	2.280
420.4	14.338	10.632	5.018	3.136	2.281
420.5	14.342	10.635	5.019	3.137	2.282
420.6	14.345	10.638	5.021	3.138	2.282
420.7	14.348	10.640	5.022	3.139	2.283
420.8	14.352	10.643	5.023	3.139	2.283
420.9	14.355	10.645	5.024	3.140	2.284
421.0	14.359	10.648	5.025	3.141	2.284
421.1	14.362	10.650	5.027	3.142	2.285
421.2	14.365	10.653	5.028	3.142	2.285
421.3	14.369	10.655	5.029	3.143	2.286
421.4	14.372	10.658	5.030	3.144	2.286
421.5	14.376	10.660	5.031	3.145	2.287
421.6	14.379	10.663	5.033	3.145	2.288
421.7	14.383	10.665	5.034	3.146	2.288
421.8	14.386	10.668	5.035	3.147	2.289
421.9	14.389	10.670	5.036	3.148	2.289
422.0	14.393	10.673	5.037	3.148	2.290
422.1	14.396	10.675	5.038	3.149	2.290
422.2	14.400	10.678	5.040	3.150	2.291
422.3	14.403	10.681	5.041	3.151	2.291
422.4	14.406	10.683	5.042	3.151	2.292
422.5	14.410	10.686	5.043	3.152	2.292
422.6	14.413	10.688	5.044	3.153	2.293
422.7	14.417	10.691	5.046	3.154	2.293
422.8	14.420	10.693	5.047	3.154	2.294
422.9	14.423	10.696	5.048	3.155	2.295
423.0	14.427	10.698	5.049	3.156	2.295
423.1	14.430	10.701	5.050	3.157	2.296
423.2	14.434	10.703	5.052	3.157	2.296
423.3	14.437	10.706	5.053	3.158	2.297
423.4	14.440	10.708	5.054	3.159	2.297
423.5	14.444	10.711	5.055	3.159	2.298
423.6	14.447	10.713	5.056	3.160	2.298
423.7	14.451	10.716	5.058	3.161	2.299
423.8	14.454	10.718	5.059	3.162	2.299
423.9	14.458	10.721	5.060	3.162	2.300
424.0	14.461	10.724	5.061	3.163	2.301
424.1	14.464	10.726	5.062	3.164	2.301
424.2	14.468	10.729	5.064	3.165	2.302
424.3	14.471	10.731	5.065	3.165	2.302
424.4	14.475	10.734	5.066	3.166	2.303
424.5	14.478	10.736	5.067	3.167	2.303
424.6	14.481	10.739	5.068	3.168	2.304
424.7	14.485	10.741	5.070	3.168	2.304
424.8	14.488	10.744	5.071	3.169	2.305
424.9	14.492	10.746	5.072	3.170	2.305

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
425.0	14.495	10.749	5.073	3.171	2.306
425.1	14.498	10.751	5.074	3.171	2.306
425.2	14.502	10.754	5.075	3.172	2.307
425.3	14.505	10.756	5.077	3.173	2.308
425.4	14.509	10.759	5.078	3.174	2.308
425.5	14.512	10.761	5.079	3.174	2.309
425.6	14.516	10.764	5.080	3.175	2.309
425.7	14.519	10.767	5.081	3.176	2.310
425.8	14.522	10.769	5.083	3.177	2.310
425.9	14.526	10.772	5.084	3.177	2.311
426.0	14.529	10.774	5.085	3.178	2.311
426.1	14.533	10.777	5.086	3.179	2.312
426.2	14.536	10.779	5.087	3.180	2.312
426.3	14.539	10.782	5.089	3.180	2.313
426.4	14.543	10.784	5.090	3.181	2.314
426.5	14.546	10.787	5.091	3.182	2.314
426.6	14.550	10.789	5.092	3.183	2.315
426.7	14.553	10.792	5.093	3.183	2.315
426.8	14.556	10.794	5.095	3.184	2.316
426.9	14.560	10.797	5.096	3.185	2.316
427.0	14.563	10.799	5.097	3.186	2.317
427.1	14.567	10.802	5.098	3.186	2.317
427.2	14.570	10.804	5.099	3.187	2.318
427.3	14.574	10.807	5.101	3.188	2.318
427.4	14.577	10.810	5.102	3.189	2.319
427.5	14.580	10.812	5.103	3.189	2.320
427.6	14.584	10.815	5.104	3.190	2.320
427.7	14.587	10.817	5.105	3.191	2.321
427.8	14.591	10.820	5.107	3.192	2.321
427.9	14.594	10.822	5.108	3.192	2.322
428.0	14.597	10.825	5.109	3.193	2.322
428.1	14.601	10.827	5.110	3.194	2.323
428.2	14.604	10.830	5.111	3.195	2.323
428.3	14.608	10.832	5.112	3.195	2.324
428.4	14.611	10.835	5.114	3.196	2.324
428.5	14.614	10.837	5.115	3.197	2.325
428.6	14.618	10.840	5.116	3.198	2.325
428.7	14.621	10.842	5.117	3.198	2.326
428.8	14.625	10.845	5.118	3.199	2.327
428.9	14.628	10.847	5.120	3.200	2.327
429.0	14.631	10.850	5.121	3.201	2.328
429.1	14.635	10.853	5.122	3.201	2.328
429.2	14.638	10.855	5.123	3.202	2.329
429.3	14.642	10.858	5.124	3.203	2.329
429.4	14.645	10.860	5.126	3.204	2.330
429.5	14.649	10.863	5.127	3.204	2.330
429.6	14.652	10.865	5.128	3.205	2.331
429.7	14.655	10.868	5.129	3.206	2.331
429.8	14.659	10.870	5.130	3.206	2.332
429.9	14.662	10.873	5.132	3.207	2.333

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
430.0	14.666	10.875	5.133	3.208	2.333
430.1	14.669	10.878	5.134	3.209	2.334
430.2	14.672	10.880	5.135	3.209	2.334
430.3	14.676	10.883	5.136	3.210	2.335
430.4	14.679	10.885	5.138	3.211	2.335
430.5	14.683	10.888	5.139	3.212	2.336
430.6	14.686	10.890	5.140	3.212	2.336
430.7	14.689	10.893	5.141	3.213	2.337
430.8	14.693	10.896	5.142	3.214	2.337
430.9	14.696	10.898	5.144	3.215	2.338
431.0	14.700	10.901	5.145	3.215	2.339
431.1	14.703	10.903	5.146	3.216	2.339
431.2	14.707	10.906	5.147	3.217	2.340
431.3	14.710	10.908	5.148	3.218	2.340
431.4	14.713	10.911	5.149	3.218	2.341
431.5	14.717	10.913	5.151	3.219	2.341
431.6	14.720	10.916	5.152	3.220	2.342
431.7	14.724	10.918	5.153	3.221	2.342
431.8	14.727	10.921	5.154	3.221	2.343
431.9	14.730	10.923	5.155	3.222	2.343
432.0	14.734	10.926	5.157	3.223	2.344
432.1	14.737	10.928	5.158	3.224	2.344
432.2	14.741	10.931	5.159	3.224	2.345
432.3	14.744	10.933	5.160	3.225	2.346
432.4	14.747	10.936	5.161	3.226	2.346
432.5	14.751	10.939	5.163	3.227	2.347
432.6	14.754	10.941	5.164	3.227	2.347
432.7	14.758	10.944	5.165	3.228	2.348
432.8	14.761	10.946	5.166	3.229	2.348
432.9	14.765	10.949	5.167	3.230	2.349
433.0	14.768	10.951	5.169	3.230	2.349
433.1	14.771	10.954	5.170	3.231	2.350
433.2	14.775	10.956	5.171	3.232	2.350
433.3	14.778	10.959	5.172	3.233	2.351
433.4	14.782	10.961	5.173	3.233	2.352
433.5	14.785	10.964	5.175	3.234	2.352
433.6	14.788	10.966	5.176	3.235	2.353
433.7	14.792	10.969	5.177	3.236	2.353
433.8	14.795	10.971	5.178	3.236	2.354
433.9	14.799	10.974	5.179	3.237	2.354
434.0	14.802	10.976	5.181	3.238	2.355
434.1	14.805	10.979	5.182	3.239	2.355
434.2	14.809	10.982	5.183	3.239	2.356
434.3	14.812	10.984	5.184	3.240	2.356
434.4	14.816	10.987	5.185	3.241	2.357
434.5	14.819	10.989	5.186	3.242	2.357
434.6	14.822	10.992	5.188	3.242	2.358
434.7	14.826	10.994	5.189	3.243	2.359
434.8	14.829	10.997	5.190	3.244	2.359
434.9	14.833	10.999	5.191	3.245	2.360

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
435.0	14.836	11.002	5.192	3.245	2.360
435.1	14.840	11.004	5.194	3.246	2.361
435.2	14.843	11.007	5.195	3.247	2.361
435.3	14.846	11.009	5.196	3.248	2.362
435.4	14.850	11.012	5.197	3.248	2.362
435.5	14.853	11.014	5.198	3.249	2.363
435.6	14.857	11.017	5.200	3.250	2.363
435.7	14.860	11.019	5.201	3.251	2.364
435.8	14.863	11.022	5.202	3.251	2.365
435.9	14.867	11.025	5.203	3.252	2.365
436.0	14.870	11.027	5.204	3.253	2.366
436.1	14.874	11.030	5.206	3.253	2.366
436.2	14.877	11.032	5.207	3.254	2.367
436.3	14.880	11.035	5.208	3.255	2.367
436.4	14.884	11.037	5.209	3.256	2.368
436.5	14.887	11.040	5.210	3.256	2.368
436.6	14.891	11.042	5.212	3.257	2.369
436.7	14.894	11.045	5.213	3.258	2.369
436.8	14.898	11.047	5.214	3.259	2.370
436.9	14.901	11.050	5.215	3.259	2.371
437.0	14.904	11.052	5.216	3.260	2.371
437.1	14.908	11.055	5.218	3.261	2.372
437.2	14.911	11.057	5.219	3.262	2.372
437.3	14.915	11.060	5.220	3.262	2.373
437.4	14.918	11.062	5.221	3.263	2.373
437.5	14.921	11.065	5.222	3.264	2.374
437.6	14.925	11.067	5.223	3.265	2.374
437.7	14.928	11.070	5.225	3.265	2.375
437.8	14.932	11.073	5.226	3.266	2.375
437.9	14.935	11.075	5.227	3.267	2.376
438.0	14.938	11.078	5.228	3.268	2.376
438.1	14.942	11.080	5.229	3.268	2.377
438.2	14.945	11.083	5.231	3.269	2.378
438.3	14.949	11.085	5.232	3.270	2.378
438.4	14.952	11.088	5.233	3.271	2.379
438.5	14.956	11.090	5.234	3.271	2.379
438.6	14.959	11.093	5.235	3.272	2.380
438.7	14.962	11.095	5.237	3.273	2.380
438.8	14.966	11.098	5.238	3.274	2.381
438.9	14.969	11.100	5.239	3.274	2.381
439.0	14.973	11.103	5.240	3.275	2.382
439.1	14.976	11.105	5.241	3.276	2.382
439.2	14.979	11.108	5.243	3.277	2.383
439.3	14.983	11.110	5.244	3.277	2.384
439.4	14.986	11.113	5.245	3.278	2.384
439.5	14.990	11.116	5.246	3.279	2.385
439.6	14.993	11.118	5.247	3.280	2.385
439.7	14.996	11.121	5.249	3.280	2.386
439.8	15.000	11.123	5.250	3.281	2.386
439.9	15.003	11.126	5.251	3.282	2.387

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
440.0	15.007	11.128	5.252	3.283	2.387
440.1	15.010	11.131	5.253	3.283	2.388
440.2	15.013	11.133	5.255	3.284	2.388
440.3	15.017	11.136	5.256	3.285	2.389
440.4	15.020	11.138	5.257	3.286	2.390
440.5	15.024	11.141	5.258	3.286	2.390
440.6	15.027	11.143	5.259	3.287	2.391
440.7	15.031	11.146	5.260	3.288	2.391
440.8	15.034	11.148	5.262	3.289	2.392
440.9	15.037	11.151	5.263	3.289	2.392
441.0	15.041	11.153	5.264	3.290	2.393
441.1	15.044	11.156	5.265	3.291	2.393
441.2	15.048	11.159	5.266	3.292	2.394
441.3	15.051	11.161	5.268	3.292	2.394
441.4	15.054	11.164	5.269	3.293	2.395
441.5	15.058	11.166	5.270	3.294	2.395
441.6	15.061	11.169	5.271	3.295	2.396
441.7	15.065	11.171	5.272	3.295	2.397
441.8	15.068	11.174	5.274	3.296	2.397
441.9	15.071	11.176	5.275	3.297	2.398
442.0	15.075	11.179	5.276	3.298	2.398
442.1	15.078	11.181	5.277	3.298	2.399
442.2	15.082	11.184	5.278	3.299	2.399
442.3	15.085	11.186	5.280	3.300	2.400
442.4	15.089	11.189	5.281	3.300	2.400
442.5	15.092	11.191	5.282	3.301	2.401
442.6	15.095	11.194	5.283	3.302	2.401
442.7	15.099	11.196	5.284	3.303	2.402
442.8	15.102	11.199	5.286	3.303	2.403
442.9	15.106	11.202	5.287	3.304	2.403
443.0	15.109	11.204	5.288	3.305	2.404
443.1	15.112	11.207	5.289	3.306	2.404
443.2	15.116	11.209	5.290	3.306	2.405
443.3	15.119	11.212	5.292	3.307	2.405
443.4	15.123	11.214	5.293	3.308	2.406
443.5	15.126	11.217	5.294	3.309	2.406
443.6	15.129	11.219	5.295	3.309	2.407
443.7	15.133	11.222	5.296	3.310	2.407
443.8	15.136	11.224	5.298	3.311	2.408
443.9	15.140	11.227	5.299	3.312	2.408
444.0	15.143	11.229	5.300	3.312	2.409
444.1	15.146	11.232	5.301	3.313	2.410
444.2	15.150	11.234	5.302	3.314	2.410
444.3	15.153	11.237	5.303	3.315	2.411
444.4	15.157	11.239	5.305	3.315	2.411
444.5	15.160	11.242	5.306	3.316	2.412
444.6	15.164	11.245	5.307	3.317	2.412
444.7	15.167	11.247	5.308	3.318	2.413
444.8	15.170	11.250	5.309	3.318	2.413
444.9	15.174	11.252	5.311	3.319	2.414

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
445.0	15.177	11.255	5.312	3.320	2.414
445.1	15.181	11.257	5.313	3.321	2.415
445.2	15.184	11.260	5.314	3.321	2.416
445.3	15.187	11.262	5.315	3.322	2.416
445.4	15.191	11.265	5.317	3.323	2.417
445.5	15.194	11.267	5.318	3.324	2.417
445.6	15.198	11.270	5.319	3.324	2.418
445.7	15.201	11.272	5.320	3.325	2.418
445.8	15.204	11.275	5.321	3.326	2.419
445.9	15.208	11.277	5.323	3.327	2.419
446.0	15.211	11.280	5.324	3.327	2.420
446.1	15.215	11.282	5.325	3.328	2.420
446.2	15.218	11.285	5.326	3.329	2.421
446.3	15.222	11.288	5.327	3.330	2.422
446.4	15.225	11.290	5.329	3.330	2.422
446.5	15.228	11.293	5.330	3.331	2.423
446.6	15.232	11.295	5.331	3.332	2.423
446.7	15.235	11.298	5.332	3.333	2.424
446.8	15.239	11.300	5.333	3.333	2.424
446.9	15.242	11.303	5.335	3.334	2.425
447.0	15.245	11.305	5.336	3.335	2.425
447.1	15.249	11.308	5.337	3.336	2.426
447.2	15.252	11.310	5.338	3.336	2.426
447.3	15.256	11.313	5.339	3.337	2.427
447.4	15.259	11.315	5.340	3.338	2.427
447.5	15.262	11.318	5.342	3.339	2.428
447.6	15.266	11.320	5.343	3.339	2.429
447.7	15.269	11.323	5.344	3.340	2.429
447.8	15.273	11.325	5.345	3.341	2.430
447.9	15.276	11.328	5.346	3.342	2.430
448.0	15.280	11.331	5.348	3.342	2.431
448.1	15.283	11.333	5.349	3.343	2.431
448.2	15.286	11.336	5.350	3.344	2.432
448.3	15.290	11.338	5.351	3.345	2.432
448.4	15.293	11.341	5.352	3.345	2.433
448.5	15.297	11.343	5.354	3.346	2.433
448.6	15.300	11.346	5.355	3.347	2.434
448.7	15.303	11.348	5.356	3.347	2.435
448.8	15.307	11.351	5.357	3.348	2.435
448.9	15.310	11.353	5.358	3.349	2.436
449.0	15.314	11.356	5.360	3.350	2.436
449.1	15.317	11.358	5.361	3.350	2.437
449.2	15.320	11.361	5.362	3.351	2.437
449.3	15.324	11.363	5.363	3.352	2.438
449.4	15.327	11.366	5.364	3.353	2.438
449.5	15.331	11.368	5.366	3.353	2.439
449.6	15.334	11.371	5.367	3.354	2.439
449.7	15.337	11.374	5.368	3.355	2.440
449.8	15.341	11.376	5.369	3.356	2.441
449.9	15.344	11.379	5.370	3.356	2.441

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
450.0	15.348	11.381	5.372	3.357	2.442
450.1	15.351	11.384	5.373	3.358	2.442
450.2	15.355	11.386	5.374	3.359	2.443
450.3	15.358	11.389	5.375	3.359	2.443
450.4	15.361	11.391	5.376	3.360	2.444
450.5	15.365	11.394	5.377	3.361	2.444
450.6	15.368	11.396	5.379	3.362	2.445
450.7	15.372	11.399	5.380	3.362	2.445
450.8	15.375	11.401	5.381	3.363	2.446
450.9	15.378	11.404	5.382	3.364	2.446
451.0	15.382	11.406	5.383	3.365	2.447
451.1	15.385	11.409	5.385	3.365	2.448
451.2	15.389	11.411	5.386	3.366	2.448
451.3	15.392	11.414	5.387	3.367	2.449
451.4	15.395	11.417	5.388	3.368	2.449
451.5	15.399	11.419	5.389	3.368	2.450
451.6	15.402	11.422	5.391	3.369	2.450
451.7	15.406	11.424	5.392	3.370	2.451
451.8	15.409	11.427	5.393	3.371	2.451
451.9	15.413	11.429	5.394	3.371	2.452
452.0	15.416	11.432	5.395	3.372	2.452
452.1	15.419	11.434	5.397	3.373	2.453
452.2	15.423	11.437	5.398	3.374	2.454
452.3	15.426	11.439	5.399	3.374	2.454
452.4	15.430	11.442	5.400	3.375	2.455
452.5	15.433	11.444	5.401	3.376	2.455
452.6	15.436	11.447	5.403	3.377	2.456
452.7	15.440	11.449	5.404	3.377	2.456
452.8	15.443	11.452	5.405	3.378	2.457
452.9	15.447	11.454	5.406	3.379	2.457
453.0	15.450	11.457	5.407	3.380	2.458
453.1	15.453	11.460	5.409	3.380	2.458
453.2	15.457	11.462	5.410	3.381	2.459
453.3	15.460	11.465	5.411	3.382	2.459
453.4	15.464	11.467	5.412	3.383	2.460
453.5	15.467	11.470	5.413	3.383	2.461
453.6	15.471	11.472	5.414	3.384	2.461
453.7	15.474	11.475	5.416	3.385	2.462
453.8	15.477	11.477	5.417	3.386	2.462
453.9	15.481	11.480	5.418	3.386	2.463
454.0	15.484	11.482	5.419	3.387	2.463
454.1	15.488	11.485	5.420	3.388	2.464
454.2	15.491	11.487	5.422	3.389	2.464
454.3	15.494	11.490	5.423	3.389	2.465
454.4	15.498	11.492	5.424	3.390	2.465
454.5	15.501	11.495	5.425	3.391	2.466
454.6	15.505	11.497	5.426	3.392	2.467
454.7	15.508	11.500	5.428	3.392	2.467
454.8	15.511	11.503	5.429	3.393	2.468
454.9	15.515	11.505	5.430	3.394	2.468

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
455.0	15.518	11.508	5.431	3.395	2.469
455.1	15.522	11.510	5.432	3.395	2.469
455.2	15.525	11.513	5.434	3.396	2.470
455.3	15.528	11.515	5.435	3.397	2.470
455.4	15.532	11.518	5.436	3.397	2.471
455.5	15.535	11.520	5.437	3.398	2.471
455.6	15.539	11.523	5.438	3.399	2.472
455.7	15.542	11.525	5.440	3.400	2.473
455.8	15.546	11.528	5.441	3.400	2.473
455.9	15.549	11.530	5.442	3.401	2.474
456.0	15.552	11.533	5.443	3.402	2.474
456.1	15.556	11.535	5.444	3.403	2.475
456.2	15.559	11.538	5.446	3.403	2.475
456.3	15.563	11.540	5.447	3.404	2.476
456.4	15.566	11.543	5.448	3.405	2.476
456.5	15.569	11.546	5.449	3.406	2.477
456.6	15.573	11.548	5.450	3.406	2.477
456.7	15.576	11.551	5.451	3.407	2.478
456.8	15.580	11.553	5.453	3.408	2.478
456.9	15.583	11.556	5.454	3.409	2.479
457.0	15.586	11.558	5.455	3.409	2.480
457.1	15.590	11.561	5.456	3.410	2.480
457.2	15.593	11.563	5.457	3.411	2.481
457.3	15.597	11.566	5.459	3.412	2.481
457.4	15.600	11.568	5.460	3.412	2.482
457.5	15.604	11.571	5.461	3.413	2.482
457.6	15.607	11.573	5.462	3.414	2.483
457.7	15.610	11.576	5.463	3.415	2.483
457.8	15.614	11.578	5.465	3.415	2.484
457.9	15.617	11.581	5.466	3.416	2.484
458.0	15.621	11.583	5.467	3.417	2.485
458.1	15.624	11.586	5.468	3.418	2.486
458.2	15.627	11.588	5.469	3.418	2.486
458.3	15.631	11.591	5.471	3.419	2.487
458.4	15.634	11.594	5.472	3.420	2.487
458.5	15.638	11.596	5.473	3.421	2.488
458.6	15.641	11.599	5.474	3.421	2.488
458.7	15.644	11.601	5.475	3.422	2.489
458.8	15.648	11.604	5.477	3.423	2.489
458.9	15.651	11.606	5.478	3.424	2.490
459.0	15.655	11.609	5.479	3.424	2.490
459.1	15.658	11.611	5.480	3.425	2.491
459.2	15.661	11.614	5.481	3.426	2.492
459.3	15.665	11.616	5.483	3.427	2.492
459.4	15.668	11.619	5.484	3.427	2.493
459.5	15.672	11.621	5.485	3.428	2.493
459.6	15.675	11.624	5.486	3.429	2.494
459.7	15.679	11.626	5.487	3.430	2.494
459.8	15.682	11.629	5.488	3.430	2.495
459.9	15.685	11.631	5.490	3.431	2.495

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
460.0	15.689	11.634	5.491	3.432	2.496
460.1	15.692	11.637	5.492	3.433	2.496
460.2	15.696	11.639	5.493	3.433	2.497
460.3	15.699	11.642	5.494	3.434	2.497
460.4	15.702	11.644	5.496	3.435	2.498
460.5	15.706	11.647	5.497	3.436	2.499
460.6	15.709	11.649	5.498	3.436	2.499
460.7	15.713	11.652	5.499	3.437	2.500
460.8	15.716	11.654	5.500	3.438	2.500
460.9	15.719	11.657	5.502	3.439	2.501
461.0	15.723	11.659	5.503	3.439	2.501
461.1	15.726	11.662	5.504	3.440	2.502
461.2	15.730	11.664	5.505	3.441	2.502
461.3	15.733	11.667	5.506	3.442	2.503
461.4	15.737	11.669	5.508	3.442	2.503
461.5	15.740	11.672	5.509	3.443	2.504
461.6	15.743	11.674	5.510	3.444	2.505
461.7	15.747	11.677	5.511	3.444	2.505
461.8	15.750	11.680	5.512	3.445	2.506
461.9	15.754	11.682	5.514	3.446	2.506
462.0	15.757	11.685	5.515	3.447	2.507
462.1	15.760	11.687	5.516	3.447	2.507
462.2	15.764	11.690	5.517	3.448	2.508
462.3	15.767	11.692	5.518	3.449	2.508
462.4	15.771	11.695	5.520	3.450	2.509
462.5	15.774	11.697	5.521	3.450	2.509
462.6	15.777	11.700	5.522	3.451	2.510
462.7	15.781	11.702	5.523	3.452	2.510
462.8	15.784	11.705	5.524	3.453	2.511
462.9	15.788	11.707	5.525	3.453	2.512
463.0	15.791	11.710	5.527	3.454	2.512
463.1	15.795	11.712	5.528	3.455	2.513
463.2	15.798	11.715	5.529	3.456	2.513
463.3	15.801	11.717	5.530	3.456	2.514
463.4	15.805	11.720	5.531	3.457	2.514
463.5	15.808	11.723	5.533	3.458	2.515
463.6	15.812	11.725	5.534	3.459	2.515
463.7	15.815	11.728	5.535	3.459	2.516
463.8	15.818	11.730	5.536	3.460	2.516
463.9	15.822	11.733	5.537	3.461	2.517
464.0	15.825	11.735	5.539	3.462	2.518
464.1	15.829	11.738	5.540	3.462	2.518
464.2	15.832	11.740	5.541	3.463	2.519
464.3	15.835	11.743	5.542	3.464	2.519
464.4	15.839	11.745	5.543	3.465	2.520
464.5	15.842	11.748	5.545	3.465	2.520
464.6	15.846	11.750	5.546	3.466	2.521
464.7	15.849	11.753	5.547	3.467	2.521
464.8	15.852	11.755	5.548	3.468	2.522
464.9	15.856	11.758	5.549	3.468	2.522

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
465.0	15.859	11.760	5.551	3.469	2.523
465.1	15.863	11.763	5.552	3.470	2.524
465.2	15.866	11.766	5.553	3.471	2.524
465.3	15.870	11.768	5.554	3.471	2.525
465.4	15.873	11.771	5.555	3.472	2.525
465.5	15.876	11.773	5.557	3.473	2.526
465.6	15.880	11.776	5.558	3.474	2.526
465.7	15.883	11.778	5.559	3.474	2.527
465.8	15.887	11.781	5.560	3.475	2.527
465.9	15.890	11.783	5.561	3.476	2.528
466.0	15.893	11.786	5.562	3.477	2.528
466.1	15.897	11.788	5.564	3.477	2.529
466.2	15.900	11.791	5.565	3.478	2.529
466.3	15.904	11.793	5.566	3.479	2.530
466.4	15.907	11.796	5.567	3.480	2.531
466.5	15.910	11.798	5.568	3.480	2.531
466.6	15.914	11.801	5.570	3.481	2.532
466.7	15.917	11.803	5.571	3.482	2.532
466.8	15.921	11.806	5.572	3.483	2.533
466.9	15.924	11.809	5.573	3.483	2.533
467.0	15.928	11.811	5.574	3.484	2.534
467.1	15.931	11.814	5.576	3.485	2.534
467.2	15.934	11.816	5.577	3.486	2.535
467.3	15.938	11.819	5.578	3.486	2.535
467.4	15.941	11.821	5.579	3.487	2.536
467.5	15.945	11.824	5.580	3.488	2.537
467.6	15.948	11.826	5.582	3.489	2.537
467.7	15.951	11.829	5.583	3.489	2.538
467.8	15.955	11.831	5.584	3.490	2.538
467.9	15.958	11.834	5.585	3.491	2.539
468.0	15.962	11.836	5.586	3.491	2.539
468.1	15.965	11.839	5.588	3.492	2.540
468.2	15.968	11.841	5.589	3.493	2.540
468.3	15.972	11.844	5.590	3.494	2.541
468.4	15.975	11.846	5.591	3.494	2.541
468.5	15.979	11.849	5.592	3.495	2.542
468.6	15.982	11.852	5.594	3.496	2.543
468.7	15.986	11.854	5.595	3.497	2.543
468.8	15.989	11.857	5.596	3.497	2.544
468.9	15.992	11.859	5.597	3.498	2.544
469.0	15.996	11.862	5.598	3.499	2.545
469.1	15.999	11.864	5.599	3.500	2.545
469.2	16.003	11.867	5.601	3.500	2.546
469.3	16.006	11.869	5.602	3.501	2.546
469.4	16.009	11.872	5.603	3.502	2.547
469.5	16.013	11.874	5.604	3.503	2.547
469.6	16.016	11.877	5.605	3.503	2.548
469.7	16.020	11.879	5.607	3.504	2.548
469.8	16.023	11.882	5.608	3.505	2.549
469.9	16.026	11.884	5.609	3.506	2.550

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
470.0	16.030	11.887	5.610	3.506	2.550
470.1	16.033	11.889	5.611	3.507	2.551
470.2	16.037	11.892	5.613	3.508	2.551
470.3	16.040	11.895	5.614	3.509	2.552
470.4	16.043	11.897	5.615	3.509	2.552
470.5	16.047	11.900	5.616	3.510	2.553
470.6	16.050	11.902	5.617	3.511	2.553
470.7	16.054	11.905	5.619	3.512	2.554
470.8	16.057	11.907	5.620	3.512	2.554
470.9	16.061	11.910	5.621	3.513	2.555
471.0	16.064	11.912	5.622	3.514	2.556
471.1	16.067	11.915	5.623	3.515	2.556
471.2	16.071	11.917	5.625	3.515	2.557
471.3	16.074	11.920	5.626	3.516	2.557
471.4	16.078	11.922	5.627	3.517	2.558
471.5	16.081	11.925	5.628	3.518	2.558
471.6	16.084	11.927	5.629	3.518	2.559
471.7	16.088	11.930	5.631	3.519	2.559
471.8	16.091	11.932	5.632	3.520	2.560
471.9	16.095	11.935	5.633	3.521	2.560
472.0	16.098	11.938	5.634	3.521	2.561
472.1	16.101	11.940	5.635	3.522	2.562
472.2	16.105	11.943	5.637	3.523	2.562
472.3	16.108	11.945	5.638	3.524	2.563
472.4	16.112	11.948	5.639	3.524	2.563
472.5	16.115	11.950	5.640	3.525	2.564
472.6	16.119	11.953	5.641	3.526	2.564
472.7	16.122	11.955	5.642	3.527	2.565
472.8	16.125	11.958	5.644	3.527	2.565
472.9	16.129	11.960	5.645	3.528	2.566
473.0	16.132	11.963	5.646	3.529	2.566
473.1	16.136	11.965	5.647	3.530	2.567
473.2	16.139	11.968	5.648	3.530	2.567
473.3	16.142	11.970	5.650	3.531	2.568
473.4	16.146	11.973	5.651	3.532	2.569
473.5	16.149	11.975	5.652	3.533	2.569
473.6	16.153	11.978	5.653	3.533	2.570
473.7	16.156	11.981	5.654	3.534	2.570
473.8	16.159	11.983	5.656	3.535	2.571
473.9	16.163	11.986	5.657	3.536	2.571
474.0	16.166	11.988	5.658	3.536	2.572
474.1	16.170	11.991	5.659	3.537	2.572
474.2	16.173	11.993	5.660	3.538	2.573
474.3	16.176	11.996	5.662	3.538	2.573
474.4	16.180	11.998	5.663	3.539	2.574
474.5	16.183	12.001	5.664	3.540	2.575
474.6	16.187	12.003	5.665	3.541	2.575
474.7	16.190	12.006	5.666	3.541	2.576
474.8	16.194	12.008	5.668	3.542	2.576
474.9	16.197	12.011	5.669	3.543	2.577

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
475.0	16.200	12.013	5.670	3.544	2.577
475.1	16.204	12.016	5.671	3.544	2.578
475.2	16.207	12.018	5.672	3.545	2.578
475.3	16.211	12.021	5.674	3.546	2.579
475.4	16.214	12.024	5.675	3.547	2.579
475.5	16.217	12.026	5.676	3.547	2.580
475.6	16.221	12.029	5.677	3.548	2.580
475.7	16.224	12.031	5.678	3.549	2.581
475.8	16.228	12.034	5.679	3.550	2.582
475.9	16.231	12.036	5.681	3.550	2.582
476.0	16.234	12.039	5.682	3.551	2.583
476.1	16.238	12.041	5.683	3.552	2.583
476.2	16.241	12.044	5.684	3.553	2.584
476.3	16.245	12.046	5.685	3.553	2.584
476.4	16.248	12.049	5.687	3.554	2.585
476.5	16.252	12.051	5.688	3.555	2.585
476.6	16.255	12.054	5.689	3.556	2.586
476.7	16.258	12.056	5.690	3.556	2.586
476.8	16.262	12.059	5.691	3.557	2.587
476.9	16.265	12.061	5.693	3.558	2.588
477.0	16.269	12.064	5.694	3.559	2.588
477.1	16.272	12.067	5.695	3.559	2.589
477.2	16.275	12.069	5.696	3.560	2.589
477.3	16.279	12.072	5.697	3.561	2.590
477.4	16.282	12.074	5.699	3.562	2.590
477.5	16.286	12.077	5.700	3.562	2.591
477.6	16.289	12.079	5.701	3.563	2.591
477.7	16.292	12.082	5.702	3.564	2.592
477.8	16.296	12.084	5.703	3.565	2.592
477.9	16.299	12.087	5.705	3.565	2.593
478.0	16.303	12.089	5.706	3.566	2.594
478.1	16.306	12.092	5.707	3.567	2.594
478.2	16.310	12.094	5.708	3.568	2.595
478.3	16.313	12.097	5.709	3.568	2.595
478.4	16.316	12.099	5.711	3.569	2.596
478.5	16.320	12.102	5.712	3.570	2.596
478.6	16.323	12.104	5.713	3.571	2.597
478.7	16.327	12.107	5.714	3.571	2.597
478.8	16.330	12.109	5.715	3.572	2.598
478.9	16.333	12.112	5.716	3.573	2.598
479.0	16.337	12.115	5.718	3.574	2.599
479.1	16.340	12.117	5.719	3.574	2.599
479.2	16.344	12.120	5.720	3.575	2.600
479.3	16.347	12.122	5.721	3.576	2.601
479.4	16.350	12.125	5.722	3.577	2.601
479.5	16.354	12.127	5.724	3.577	2.602
479.6	16.357	12.130	5.725	3.578	2.602
479.7	16.361	12.132	5.726	3.579	2.603
479.8	16.364	12.135	5.727	3.580	2.603
479.9	16.367	12.137	5.728	3.580	2.604

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
480.0	16.371	12.140	5.730	3.581	2.604
480.1	16.374	12.142	5.731	3.582	2.605
480.2	16.378	12.145	5.732	3.583	2.605
480.3	16.381	12.147	5.733	3.583	2.606
480.4	16.385	12.150	5.734	3.584	2.607
480.5	16.388	12.152	5.736	3.585	2.607
480.6	16.391	12.155	5.737	3.585	2.608
480.7	16.395	12.158	5.738	3.586	2.608
480.8	16.398	12.160	5.739	3.587	2.609
480.9	16.402	12.163	5.740	3.588	2.609
481.0	16.405	12.165	5.742	3.588	2.610
481.1	16.408	12.168	5.743	3.589	2.610
481.2	16.412	12.170	5.744	3.590	2.611
481.3	16.415	12.173	5.745	3.591	2.611
481.4	16.419	12.175	5.746	3.591	2.612
481.5	16.422	12.178	5.748	3.592	2.613
481.6	16.425	12.180	5.749	3.593	2.613
481.7	16.429	12.183	5.750	3.594	2.614
481.8	16.432	12.185	5.751	3.594	2.614
481.9	16.436	12.188	5.752	3.595	2.615
482.0	16.439	12.190	5.753	3.596	2.615
482.1	16.443	12.193	5.755	3.597	2.616
482.2	16.446	12.195	5.756	3.597	2.616
482.3	16.449	12.198	5.757	3.598	2.617
482.4	16.453	12.201	5.758	3.599	2.617
482.5	16.456	12.203	5.759	3.600	2.618
482.6	16.460	12.206	5.761	3.600	2.618
482.7	16.463	12.208	5.762	3.601	2.619
482.8	16.466	12.211	5.763	3.602	2.620
482.9	16.470	12.213	5.764	3.603	2.620
483.0	16.473	12.216	5.765	3.603	2.621
483.1	16.477	12.218	5.767	3.604	2.621
483.2	16.480	12.221	5.768	3.605	2.622
483.3	16.483	12.223	5.769	3.606	2.622
483.4	16.487	12.226	5.770	3.606	2.623
483.5	16.490	12.228	5.771	3.607	2.623
483.6	16.494	12.231	5.773	3.608	2.624
483.7	16.497	12.233	5.774	3.609	2.624
483.8	16.501	12.236	5.775	3.609	2.625
483.9	16.504	12.238	5.776	3.610	2.626
484.0	16.507	12.241	5.777	3.611	2.626
484.1	16.511	12.244	5.779	3.612	2.627
484.2	16.514	12.246	5.780	3.612	2.627
484.3	16.518	12.249	5.781	3.613	2.628
484.4	16.521	12.251	5.782	3.614	2.628
484.5	16.524	12.254	5.783	3.615	2.629
484.6	16.528	12.256	5.785	3.615	2.629
484.7	16.531	12.259	5.786	3.616	2.630
484.8	16.535	12.261	5.787	3.617	2.630
484.9	16.538	12.264	5.788	3.618	2.631

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
485.0	16.541	12.266	5.789	3.618	2.631
485.1	16.545	12.269	5.790	3.619	2.632
485.2	16.548	12.271	5.792	3.620	2.633
485.3	16.552	12.274	5.793	3.621	2.633
485.4	16.555	12.276	5.794	3.621	2.634
485.5	16.558	12.279	5.795	3.622	2.634
485.6	16.562	12.281	5.796	3.623	2.635
485.7	16.565	12.284	5.798	3.624	2.635
485.8	16.569	12.287	5.799	3.624	2.636
485.9	16.572	12.289	5.800	3.625	2.636
486.0	16.576	12.292	5.801	3.626	2.637
486.1	16.579	12.294	5.802	3.627	2.637
486.2	16.582	12.297	5.804	3.627	2.638
486.3	16.586	12.299	5.805	3.628	2.639
486.4	16.589	12.302	5.806	3.629	2.639
486.5	16.593	12.304	5.807	3.630	2.640
486.6	16.596	12.307	5.808	3.630	2.640
486.7	16.599	12.309	5.810	3.631	2.641
486.8	16.603	12.312	5.811	3.632	2.641
486.9	16.606	12.314	5.812	3.632	2.642
487.0	16.610	12.317	5.813	3.633	2.642
487.1	16.613	12.319	5.814	3.634	2.643
487.2	16.616	12.322	5.816	3.635	2.643
487.3	16.620	12.324	5.817	3.635	2.644
487.4	16.623	12.327	5.818	3.636	2.645
487.5	16.627	12.330	5.819	3.637	2.645
487.6	16.630	12.332	5.820	3.638	2.646
487.7	16.634	12.335	5.822	3.638	2.646
487.8	16.637	12.337	5.823	3.639	2.647
487.9	16.640	12.340	5.824	3.640	2.647
488.0	16.644	12.342	5.825	3.641	2.648
488.1	16.647	12.345	5.826	3.641	2.648
488.2	16.651	12.347	5.827	3.642	2.649
488.3	16.654	12.350	5.829	3.643	2.649
488.4	16.657	12.352	5.830	3.644	2.650
488.5	16.661	12.355	5.831	3.644	2.650
488.6	16.664	12.357	5.832	3.645	2.651
488.7	16.668	12.360	5.833	3.646	2.652
488.8	16.671	12.362	5.835	3.647	2.652
488.9	16.674	12.365	5.836	3.647	2.653
489.0	16.678	12.367	5.837	3.648	2.653
489.1	16.681	12.370	5.838	3.649	2.654
489.2	16.685	12.373	5.839	3.650	2.654
489.3	16.688	12.375	5.841	3.650	2.655
489.4	16.691	12.378	5.842	3.651	2.655
489.5	16.695	12.380	5.843	3.652	2.656
489.6	16.698	12.383	5.844	3.653	2.656
489.7	16.702	12.385	5.845	3.653	2.657
489.8	16.705	12.388	5.847	3.654	2.658
489.9	16.709	12.390	5.848	3.655	2.658

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
490.0	16.712	12.393	5.849	3.656	2.659
490.1	16.715	12.395	5.850	3.656	2.659
490.2	16.719	12.398	5.851	3.657	2.660
490.3	16.722	12.400	5.853	3.658	2.660
490.4	16.726	12.403	5.854	3.659	2.661
490.5	16.729	12.405	5.855	3.659	2.661
490.6	16.732	12.408	5.856	3.660	2.662
490.7	16.736	12.410	5.857	3.661	2.662
490.8	16.739	12.413	5.859	3.662	2.663
490.9	16.743	12.416	5.860	3.662	2.664
491.0	16.746	12.418	5.861	3.663	2.664
491.1	16.749	12.421	5.862	3.664	2.665
491.2	16.753	12.422	5.863	3.665	2.665
491.3	16.756	12.426	5.864	3.665	2.666
491.4	16.760	12.428	5.866	3.666	2.666
491.5	16.763	12.431	5.867	3.667	2.667
491.6	16.767	12.433	5.868	3.668	2.667
491.7	16.770	12.436	5.869	3.668	2.668
491.8	16.773	12.438	5.870	3.669	2.668
491.9	16.777	12.441	5.872	3.670	2.669
492.0	16.780	12.443	5.873	3.671	2.669
492.1	16.784	12.446	5.874	3.671	2.670
492.2	16.787	12.448	5.875	3.672	2.671
492.3	16.790	12.451	5.876	3.673	2.671
492.4	16.794	12.453	5.878	3.674	2.672
492.5	16.797	12.456	5.879	3.674	2.672
492.6	16.801	12.459	5.880	3.675	2.673
492.7	16.804	12.461	5.881	3.676	2.673
492.8	16.807	12.464	5.882	3.677	2.674
492.9	16.811	12.466	5.884	3.677	2.674
493.0	16.814	12.469	5.885	3.678	2.675
493.1	16.818	12.471	5.886	3.679	2.675
493.2	16.821	12.474	5.887	3.679	2.676
493.3	16.825	12.476	5.888	3.680	2.677
493.4	16.828	12.479	5.890	3.681	2.677
493.5	16.831	12.481	5.891	3.682	2.678
493.6	16.835	12.484	5.892	3.682	2.678
493.7	16.838	12.486	5.893	3.683	2.679
493.8	16.842	12.489	5.894	3.684	2.679
493.9	16.845	12.491	5.896	3.685	2.680
494.0	16.848	12.494	5.897	3.685	2.680
494.1	16.852	12.496	5.898	3.686	2.681
494.2	16.855	12.499	5.899	3.687	2.681
494.3	16.859	12.502	5.900	3.688	2.682
494.4	16.862	12.504	5.901	3.688	2.682
494.5	16.865	12.507	5.903	3.689	2.683
494.6	16.869	12.509	5.904	3.690	2.684
494.7	16.872	12.512	5.905	3.691	2.684
494.8	16.876	12.514	5.906	3.691	2.685
494.9	16.879	12.517	5.907	3.692	2.685

RECORDER READING	VANE DIA=.5" HT = 1"	VANE DIA=.5" HT =.5"	VANE DIA=1" HT=.5"	VANE DIA=1" HT =1"	VANE DIA= 1" HT =1.5"
MILLI-VOLTS	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)	SHEAR STRENGTH (PSI)
495.0	16.882	12.519	5.909	3.693	2.686
495.1	16.886	12.522	5.910	3.694	2.686
495.2	16.889	12.524	5.911	3.694	2.687
495.3	16.893	12.527	5.912	3.695	2.687
495.4	16.896	12.529	5.913	3.696	2.688
495.5	16.900	12.532	5.915	3.697	2.688
495.6	16.903	12.534	5.916	3.697	2.689
495.7	16.906	12.537	5.917	3.698	2.690
495.8	16.910	12.539	5.918	3.699	2.690
495.9	16.913	12.542	5.919	3.700	2.691
496.0	16.917	12.545	5.921	3.700	2.691
496.1	16.920	12.547	5.922	3.701	2.692
496.2	16.923	12.550	5.923	3.702	2.692
496.3	16.927	12.552	5.924	3.703	2.693
496.4	16.930	12.555	5.925	3.703	2.693
496.5	16.934	12.557	5.927	3.704	2.694
496.6	16.937	12.560	5.928	3.705	2.694
496.7	16.940	12.562	5.929	3.706	2.695
496.8	16.944	12.565	5.930	3.706	2.696
496.9	16.947	12.567	5.931	3.707	2.696
497.0	16.951	12.570	5.933	3.708	2.697
497.1	16.954	12.572	5.934	3.709	2.697
497.2	16.958	12.575	5.935	3.709	2.698
497.3	16.961	12.577	5.936	3.710	2.698
497.4	16.964	12.580	5.937	3.711	2.699
497.5	16.968	12.582	5.939	3.712	2.699
497.6	16.971	12.585	5.940	3.712	2.700
497.7	16.975	12.588	5.941	3.713	2.700
497.8	16.978	12.590	5.942	3.714	2.701
497.9	16.981	12.593	5.943	3.715	2.701
498.0	16.985	12.595	5.944	3.715	2.702
498.1	16.988	12.598	5.946	3.716	2.703
498.2	16.992	12.600	5.947	3.717	2.703
498.3	16.995	12.603	5.948	3.718	2.704
498.4	16.998	12.605	5.949	3.718	2.704
498.5	17.002	12.608	5.950	3.719	2.705
498.6	17.005	12.610	5.952	3.720	2.705
498.7	17.009	12.613	5.953	3.721	2.706
498.8	17.012	12.615	5.954	3.721	2.706
498.9	17.016	12.618	5.955	3.722	2.707
499.0	17.019	12.620	5.956	3.723	2.707
499.1	17.022	12.623	5.958	3.724	2.708
499.2	17.026	12.625	5.959	3.724	2.709
499.3	17.029	12.628	5.960	3.725	2.709
499.4	17.033	12.631	5.961	3.726	2.710
499.5	17.036	12.633	5.962	3.726	2.710
499.6	17.039	12.636	5.964	3.727	2.711
499.7	17.043	12.638	5.965	3.728	2.711
499.8	17.046	12.641	5.966	3.729	2.712
499.9	17.050	12.643	5.967	3.729	2.712

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13. ABSTRACT

A sophisticated vane shear apparatus for determining the shear strength of deep ocean sediment cores was modified so as to be portable and versatile for use in a laboratory and on board a ship. The apparatus utilizes a torque transducer that is insensitive to temperature changes or orientation and capable of measuring torque over the entire range of shear strength encountered in marine sediments. Shear strength measurements can be made with a minimum disturbance to the sediment sample by testing directly in the core liner. The apparatus was used to determine shear strength of ten deep ocean cores from the Guide Seamount region, located about 70 miles west of the central California coast. The study also included the determination of other engineering properties of the sediment cores.

14 KEY WORDS	LINK A ROLE	LINK A WT	LINK B ROLE	LINK B WT	LINK C ROLE	LINK C WT
Deep sea cores						
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Guide Seamount						
Portable Vane Shear Apparatus						
Sediments						
Shear Strength of Sediments						
Vane Shear						
Torque Transducer						

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